Vol. 13 FEBRUARY, 1924 No. 2

ENTRIES 625-1346

M. J. Dorsey

BOTANICAL ABSTRACTS

PUBLISHED MONTHLY UNDER THE DIRECTION OF

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THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.,

by

WILLIAMS & WILKINS COMPANY

BALTIMORE, U. S. A.

Entered as second-class matter, November 9, 1918, at the post office at Baltimore, Maryland, under the Act of March 3, 1879

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UNDER THE DIRECTION OF

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J. R. Schramm, Editor-in-Chief
National Research Council, Washington, D. C.

Vol. 13 FEBRUARY, 1924 No. 2

ENTRIES 625–1346

AGRONOMY

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(See also in this issue Entries 715, 753, 845, 873, 897, 908, 909, 910, 1030, 1031, 1033, 1037, 1068, 1097, 1200, 1206, 1223, 1225, 1229, 1233, 1261)

625. Anonymous. **Agriculture on the highlands of central Victoria.** Jour. Dept. Agric. Victoria 20: 680–685. 1922.—Practical suggestions on farming are given.—*Wm. E. Lawrence.*

626. Anonymous. **Millet.** Jour. Dept. Agric. Victoria 20: 108–112. *Fig. 1–7.* 1922.—In Australia the millets are used principally for early summer grazing, green feed for stock throughout the summer, to supplement the farm hay supply, or to occupy otherwise idle land. Foxtail millets (*Setaria italica*) are recommended for hay in the drier parts, and Broomcorn millets (*Panicum miliaceum*) for the production of bird-seed and for grazing. Where irrigation is available Barnyard millets (*Echinochloa frumentacea*) are desirable for grazing, hay and ensilage, and Pearl millets (*Pennisetum glaucum*) for pasturing and soiling. Cultural directions are included as well as instructions for the utilization of the crop as pasture, hay, green feed, and ensilage. A warning is added regarding the feeding of millet hay to horses, except in limited quantities and in connection with other feeds.—*H. N. Vinall.*

627. Anonymous. **Some results of experimental work of the Field Branch, Department of Agriculture.** Jour. Dept. Agric. Victoria 20: 218–222. 1922.—The results of field variety and fertilizer tests are given.—*Wm. E. Lawrence.*

628. Anonymous. **Wheat-growing.** Jour. Dept. Agric. Victoria 20: 124. 1922.—The potential wheat-growing area of Australia is 200–300 million acres. The maximum area thus far planted to wheat is 12 million acres.—*Wm. E. Lawrence.*

629. Alway, F. J. **Report of the Golden Valley peat experiment fields.** Minnesota Agric. Exp. Sta. Bull. 194. *116 p.* 1920.—The peat on which the crops were grown is a high, lime, grass-covered bog. Nitrogen and potash are present in the amounts needed for present crop growth, but phosphates must be supplied. Flax gave the most promising returns on the unburned peat, and oats, winter rye, field peas, clovers and grasses gave good results. Frosts during the summer make it hazardous to attempt to raise corn and other crops sensitive to cold.—*A. C. Arny.*

630. Arny, A. C. **Wheat and flax as combination crops.** Minnesota Agric. Exp. Sta. Bull. 204. *21 p.* 1923.—The 10 years' results of growing wheat and flax in combination as compared with each crop grown alone are summarized. Early trials using Bluestem wheat and non-wilt-

resistant flax gave no consistent advantage for the combination crop. During 1917–19 Marquis wheat and Primost flax, a non-wilt-resistant variety, gave percentage yields of 105 and 110, on the basis of 100 for the crops grown alone; the relatively high price of wheat during this period made it more profitable to grow wheat alone than to grow the larger yields of the mixed crops. On the same basis the 1920–22 combination crops yielded at the rate of 107.4 and 102.5. The mixture giving the highest yield was also worth slightly more per acre than the crop grown alone. Mixtures of oats and flax and of barley and flax were not found practicable where non-resistant strains of flax were used. The wheat-flax combination crop was less weedy and easier to harvest, shock and thresh than flax grown alone. Where there is a ready sale for clean flax straw for manufacturing purposes the combination crop is not advised.—*A. C. Arny.*

631. Audas, J. W. **A valuable legume. Bokhara or sweet clover (Melilotus alba Desr.)** Jour. Dept. Agric. Victoria **20**: 496–498. *1 fig.* 1922.—Comparisons are also made with the yellow sweet clover (*Melilotus officinalis*) and the Indian sweet clover or King Island melilot (*M. parviflora*).—*Wm. E. Lawrence.*

632. B[arber], C. A. **Sugar cane experiments in Queensland.** [Rev. of: Easterly, H. T. **Annual report of the Director of the Sugar Experiment Station in Queensland for year ending October, 1922.**] Internat. Sugar, Jour. **25**: 289–291. 1923.

633. Bartels, L. C. **The Snowy River flats at Orbost.** Jour. Dept. Agric. Victoria **20**: 393–399. *Illus.* 1922.—Maize and bean growing are discussed. The chief weeds mentioned are Prince of Wales' Feather (*Amaranthus*), thornapple (*Datura stramonium*), Fathen (*Chenopodium glaucum*), Cockshin (*Panicum crus galli*), and Peterson's pest (*Galinsoga parviflora*).—*Wm. E. Lawrence.*

634. Bevan, W. **Cotton seed.** Cyprus Agric. Jour. **18**: 49. 1923.—Cotton seed degenerates rapidly as to quantity and quality of lint when no special care is taken to preserve its purity and vigor. This is believed to be directly responsible for the smaller acreage grown in Cyprus and the poor average yield. Instruction is given for marking of seed plants bearing the earliest, most numerous and finest bolls.—*W. Stuart.*

635. Bevan, W. **Importation of seed potatoes.** Cyprus Agric. Jour. **18**: 63–64. 1923.—The Cyprus potato industry for 1918–1922 represents an average annual export of 5,175 tons. The tendency of potatoes to degenerate is discussed, also the customary practice of renewing the vigor of seed by sending it from the plains to the higher parts of the Island to be grown there 1 year. Mention is made of the importation of seed potatoes from France and more recently from Ireland. The danger of bringing in new diseases and insect pests is emphasized, e.g., the introduction of the potato moth (*Phtherimaea opereulla*) a few years ago and the difficulty of preventing its spread.—*W. Stuart.*

636. Blakely, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales **34**: 575–579. *2 fig.* 1923.—Devil's Claw (*Proboscidea louisiana*) was first reported in N. S. W. in 1905. It is a serious pest to stockowners in the western districts, but is easily brought under control. *P. lutea,* said to cause dizziness to those working near it, has recently been introduced. These 2 and *P. fragrans* are described and methods suggested for their control.—*L. R. Waldron.*

637. Bonnett, R. K., and F. L. Burkart. **Rate of seeding—A factor in variety tests.** Jour. Amer. Soc. Agron. **15**: 161–171. 1923.—An accurate measurement of the delivery rate of seeding can be determined by means of the canvas frame designed to collect the surplus grain carried during seeding.—*F. M. Schertz.*

638. Brown, E. B., and H. S. Garrison. **Influence of spacing on productivity in single ear and prolific types of corn.** U. S. Dept. Agric. Bull. 1157. *10 p., illus.* 1923.—At Clarksdale, Mississippi, Waco and San Antonio, Texas, and Rosslyn, Virginia, 4 single ear varieties and 3 prolific varieties were used for 1–4 years. In general the prolific type proved more productive than the single ear type and the authors conclude that "in sections to which both types are adapted the prolific would be the more productive type under the conditions of general field culture, because of its better adjustment to varying conditions."—*J. H. Kempton.*

639. Brunning, Leslie H. **Fodder crops for Australia.** *127 p., illus.* F. H. Brunning Pty. Ltd.: Melbourne, 1922.—This booklet treats (1) root crops; (2) *Brassicas;* (3) annual summer fodder crops including, sorghums, maize, Sudan grass, pumpkin, cowpea, peanut,

sunflower, buckwheat, and Japanese millet; (4) clovers including *Trifoliums, Melilots* and *Medicagos, Lotus* and *Lespedeza;* (5) grasses. A short discussion of each crop deals with varieties, cultural practices, and utilization.—*Roland McKee.*

640. Cauthen, E. F., and J. T. Williamson. **Time of applying nitrate of soda to cotton.** Alabama Agric. Exp. Sta. Bull. 209. *15 p.* 1920.—Results reported in Part I under conditions before the advent of the boll weevil show that applications made 29 days after planting gave the largest increase in seed cotton.—Results reported in Part II show that the largest increase of seed cotton was obtained when 100 pounds of nitrate of soda per acre were applied by the time the first squares appeared. The application of 100 pounds of nitrate of soda about 30 days after planting and 100 pounds about 20 days after the first blooms, gives a larger yield and a slightly greater profit.—*Wright A. Gardner.*

641. Clarke, G., M. Naib Husain, and S. C. Bannerjee. **Coimbatore sugar cane seedlings in the United Provinces.** Agric. Jour. India **17**: 445–462. 1922.—A systematic examination of a series of seedling canes raised at the cane breeding station at Coimbatore is described, the majority proving to be of poor quality; Co. 214, however, is considered suitable for at least 1 important sugar tract in the United Provinces. Full details are given of (1) the type of cane required to suit the climatic conditions of this the most important cane growing area of India and (2) the field and laboratory methods used in the trials.—*A. Howard.*

642. Clayton, E. S. **Sorghum experiments on the upper north coast.** Agric. Gaz. New South Wales **34**: 546. 1923.—A locally developed variety of sorghum known as Saccaline outyielded other varieties in the experiment.—*L. R. Waldron.*

643. Dahl, A. L. **Feeding the soils. What the farmer has to put in to pay for what he takes out.** Sci. Amer. **128**: 316, 360. *3 fig.* 1923.—Soil needs are discussed, including a brief account of the utilization of the fertilizer constituents of city garbage. The value of farm manure, the need of lime, and the efficacy of cover crops are emphasized.—*Mary R. Burr.*

644. Davey, H. W. **Weeds and their eradication.** Jour. Dept. Agric. Victoria **20**: 80–86, 165–169, 226–231, 289–294, 361–365, 411–414, 477–480, 603–606, 667–670. *Fig. 16–46, and 4 fig.* 1922.—Discussions and control measures are given for the following weed pests of Victoria: Artichoke thistle (*Cynara cardunculus* L.), purple foxglove (*Digitalis purpurea* L.), twiggy or spurious mullein (*Verbascum blatteria,* L.), ragwort (*Senecio Jacobaea* L.), poison hemlock (*Conium maculatum* L.), red ink plant (*Phytolacca octandra* L.), prickly lettuce (*Lactuca scariola* L.), *Amaranthus retroflexus* L., perennial Californian thistle (*Carduus arvensis* Robinson), wild radish (*Raphanus raphanistrum* L.), stinkwort (*Inula graveolens*), bracken fern (*Pteris aquilina*), blackberry or bramble (*Rubus fruticosus* L.), cut-leaved blackberry (*R. laciniatus* Willd.), Paterson's Curse or purple bugloss (*Echium violaceum*) introduced from Austria, wild verbena (*Verbena bonariensis* L.), onion grass or Guilford grass (*Romulea cruciata*), and onion weed (*Asphodelus fistulosus* L.)—*Wm. E. Lawrence.*

645. Faulkner, O. T. **Unavoidable error of field experiments.** Agric. Jour. India **18**: 235–248. *Fig. 1–2.* 1923.—The effect of variation in the size and shape of the plot, when the yields of adjacent plots only are compared, is discussed. The following advice is based on the results obtained: (1) only adjacent plots should be compared; (2) the width of each plot should be the minimum consistent with other considerations such as reducing the border effect to reasonable proportions. Instead of increasing the width of each plot beyond this minimum it would be better to have more duplicates; (3) the length should be 5 times the width.—*A. Howard.*

646. Geerts, J. M. **De factoren, die het product bepalen. Tiende bydrage: De cultuureischen der rietsoorten.** [**Yield-determining factors. Tenth contribution. Cultural requirements of cane varieties.**] Arch. Suikerindust. Nederland.-Indië **31**: 323–336. 1923.—Cultural conditions and statistical data regarding yield, lodging, stooling, arrowing, weight, length, etc., are given for the varieties discussed in former papers. The following observations are made: 247B has been withdrawn to stiff, not easily drained soils; on the better soils it is replaced by EK28, on wet fertile soils by Tjepiring 24, on stiff soils by EK 2 and 2714 P. O. J. —100 P. O. J. compares favorably with D. I. 52, but lodges heavily and is less drought resistant; it is also quite susceptible to gumming disease and vascular disease.—D. I. 52 replaces 100 P. O. J. especially on wet soils, yields a greater tonnage than 100 P. O. J. because of a continu-

ous though slower growth, arrows but little, and is susceptible to yellow stripe disease.—E. K. 2 yields the highest tonnage, but has the lowest sugar content. It may give a good total product on special soils where it can grow for a long time. It must be planted early if the soils dry out in the East Monsoon; it is susceptible to gumming disease.—E. K. 28 is the best producing variety, lodges but little, and is self-cleaning. It replaces many varieties on different soils, and is susceptible to root rot and therefore requires attention under irrigation because susceptible to rapid changes in soil moisture conditions.—90 F stools heavily, is susceptible to drought and vascular-bundle disease, lodges heavily on good soils, and must be harvested early as it soon contracts rootrot.—Tjepiring 24 is the slowest grower of all, requiring good conditions of growth, is immune to stripe disease and vascular-bundle disease, and replaces 247 B. Wherever the latter lodges severely Tjepiring 24 must be planted early.—*Peter J. Klaphaak.*

647. Geerts, J. M. **De factoren, die het product bepalen. Elfde bydrage. Het product der nieuwe P. O. J.-nummers 2714 en 2725. [Yield-determining factors. Eleventh contribution. The product of the new P. O. J. varieties 2714 and 2725.]** Arch. Suikerindust. Nederland.-Indië 31: 369–382. 1923.—The author concludes that E. K. 28 and D. I. 52 are still the best varieties, with which the new ones cannot fully compete although the latter replace 247 B in many cases, especially on heavy clay soil.—The following comparisons are made: 2725 P. O. J. usually remains short, is slightly heavier than 2714 P. O. J., stools more but yields less cane, lodges less, and produces about the same as 2714 P. O. J. The variety is recommended when the cane can remain a long time before cutting. 2714 P. O. J. is longer than 247 B, lodges heavily and arrows freely, but is higher in yield of sugar. It is thicker than E. K. 28, with heavier stooling, but is shorter, while E. K. 28 grows faster, lodges less, and has a better sugar yield. 2714 P. O. J. is immune to stripe disease and sereh; bibit (cuttings) are large and coarse and break easily at the nodes. It gave better results than 2725 P. O. J.—*Peter J. Klaphaak.*

648. Geerts, J. M. **De factoren, die het product bepalen. Twaalfde bydrage. Samenvatting der vorige bijdragen. [Yield-determining factors. Twelfth contribution. Summary of the former contributions.]** Arch. Suikerindust. Nederland.-Indië 31: 473–481. 1923.—The following conclusions are reported. I. The cane product is not so much dependent on the total rainfall as on its distribution, the critical periods being planting time, end of the East Monsoon when irrigation water becomes scarce, middle of the West Monsoon when bandjirs appear, end of the West Monsoon when the cane ripens, end of harvesting time when the cane is dying. A study of local conditions and changes in time of planting and variety gave increased sugar yields, due to better ripening, in localities where the sugar yield was low, even though a high tonnage was obtained.—II. The factor for growth, the weight-valuation factor, and the sugar product are parallel. The factor for growth is dependent on climatological and soil conditions, time of planting, time and amount of fertilizing, etc. It is expressed as $\frac{\text{East Monsoon growth in cm. per day}}{\text{West Monsoon growth in cm. per day}}$. A large East Monsoon growth gives better results.—The weight-valuation factor changes parallel with the growth factor and is found by obtaining the length of the cane, the stooling, and total tonnage. The kattie ($\frac{1}{100}$ pikol) weight per m. length × average stooling gives the weight-valuation factor. Stooling is dependent on time of planting, climate, and methods of cultivation. The length of cane is taken on April 1 or May 1.—The sugar product is tonnage × extractable sugar. This is dependent on the growth factor and the weight-valuation factor, as both tonnage and extractable sugar change in correlation with these factors.—Lodging, extractable sugar, and planting time are to be treated in a separate article, after which final conclusions will be presented.—*Peter J. Klaphaak.*

649. Geerts, J. M. **De factoren, die het product bepalen. Dertiende bijdrage. Het legeren van het riet. [Yield-determining factors. Thirteenth contribution. Lodging of cane.]** Arch. Suikerindust. Nederland.-Indië 31: 513–522. 1923.—Tendency to lodging and true lodging are differentiated. The former is dependent on internal, the latter on external factors. When the crop is heavy, true lodging is heavy. Lodging may be due to wind, rain, volcanic-ash rain, growth on too fertile soils, manuring, soil moisture, etc. The results of lodging are very diverse for different varieties. Brittle varieties, e.g., 100 P. O. J., usually break by lodging; others form many roots, e.g., D. I. 52. E. K. 28 does not decrease as much

in sugar content when lodging as do other varieties.—Measures against lodging are: (1) deep planting; this is favorable only when the cane product is decreased by it, otherwise the same percentage of lodging is reached. (2) Early planting, to obtain a thinner leaf-crown when the heavy rains come. (3) Less stooling and wider planting to give more air and light to plants. (4) Planting in Reyonoso gardens and not in plowed ground where lodging is high. (5) Cutting of leaves 1 gm. above leafsheaths (Douglas) or topping of canes (247 B withstands this better than 100 P. O. J.; buds sometimes sprout and decrease the yield). (6) Binding up of cane; tied cane always gives a decreased sugar yield. (7) Rational fertilizing and selecting of varieties may partly prevent lodging. The last coupled with timely planting gives the best results.—*Peter J. Klaphaak.*

650. Gennys, R. H. **Roughage.** Agric. Gaz. New South Wales **34**: 573–574. 1923.—Roughage from maize and the small grains is considered as feed for dairy cattle.—*L. R. Waldron.*

651. Groh, Herbert. **A survey of weed control and investigation in Canada.** Sci. Agric. **3**: 415–420. 1923.—The weed-control work which has been done up to the present has been principally under federal and provincial government auspices. These activities embrace legislation, which, with the exception of the Dominion Seed Control Act, is all provincial; investigation, more or less technical; and the dissemination of information through public meetings and publications.—*H. Groh.*

652. Harreveld, J. van. **De samenstelling van den aanplant 1922–1923.** [**The planting, 1922–1923.**] Mededeel. Proefsta. Java-Suikerindust. **1923**: 95–116. 1923.—Data from 177 mills show the following percentage production in Java by varieties each representing above 1 per cent of the total planting: E. K. 28, 40; D. I. 52, 21½; 247 B, 15½; E. K. 2, 6; 90 F, 3; S.W. 3, 2¾; 100 P. O. J., 2¾; 2714 P. O. J., 2¾; 2725 P. O. J., 1; S. W. 111, 1; other varieties, 4¾. E. K. 28 shows a slightly increased total, though it has decreased locally. D. I. 52 is increasing generally, while 247 B and 100 P. O. J. are still decreasing.—*Peter J. Klaphaak.*

653. Harreveld, J. van. **Statistiek van de verbreiding en de productie der rietsoorten in Oogstjaar 1920.** [**Statistics regarding sugar cane varieties from 1920 crop.**] Mededeel. Proefsta. Java-Suikerindust. **1923**: 17–94. 1923.—Of 183 mills, 173 submitted data from which tables were prepared. Percentage sugarcane production on Java by varieties is as follows: E. K. 28, 31½; 247 B, 26½; D. I. 52, 13¾; 100 P. O. J., 10; E. K. 2, 6½; 90 F., 3; S. W. 3, 1¾; Tjepiring 24, 1; other varieties, 6.—*Peter J. Klaphaak.*

654. Harreveld, J. van. **Statistiek van de verbreiding en de productie der rietsoorten in Oogstjaar 1922.** [**Statistics regarding sugarcane varieties from the 1922 crop.**] Mededeel. Proefsta. Java-Suikerindust. **1923**: 513–536. 1923.—Data from 174 out of 182 mills show the following percentage production in Java: E. K. 28, 39¼; D. I. 52, 18¾; 247 B, 17; E. K. 2, 6½; 100 P. O. J., 4; 90 F, 3¼; S. W. 3, 2½; 2714 P. O. J., 1¾; 2725 P. O. J., 1½; other varieties, 5½. Tables, some of which are arranged according to mills, give data regarding yields, milling dates, origin of bibit, etc.—*Peter J. Klaphaak.*

655. Harreveld, Ph. van. **Werkplan der cultuurafdeeling voor het jaar 1923.** [**Workplan of the culture division for the year 1923.**] Arch. Suikerindust. Nederland-Indië **31**: 989–1009. 1923.—The program of the Experiment Station for the Java Sugar Industry for 1923 is outlined and represents mainly a continuation of projects begun or extended in 1922, including analysis of samples, identification of diseases, visits to plantations, coöperative meteorological observations, variety and fertilizer tests, irrigation experiments, summary of plantation experiments, investigation of cane diseases, descriptions and cytological investigation of sugar cane, cane improvement, distribution of cuttings of new varieties, training of group advisors, comparison of results of mechanical plowing, demonstrations, short courses, etc.—*Peter J. Klaphaak.*

656. Hayes, H. K. **Controlling experimental error in nursery trials.** Jour. Amer. Soc. Agron. **15**: 177–192. 1923.—Three-row plots, each approximately 16 feet in length, and the use of only the central row in the yield test is a desirable plan. Replication, in general, reduces the probable error according to mathematical expectancy. Four systematically distributed plots for each variety in the trial is suggested as a desirable plan.—*F. M. Schertz.*

657. Howes, E. A. **Irrigation farming.** Sci. Agric. **3**: 294–295. 1923.—Irrigation farming in general and experimental work in Alberta are discussed.—*T. G. Major.*

658. Howitt, J. E. **Coöperative experiments in weed eradication.** Sci. Agric. 3: 310–312. 1923.—Results show that perennial sow thistle and twitch grass may be controlled by the use of pasture rape on infested fields. For bladder campion or cow bell deep fall plowing, cross cultivation, and the growing of a hoed crop, such as corn, have given good results. Mustard may be held in check by spraying with iron sulphate.—*T. G. Major.*

659. Hutchinson, C. M. **A source of error in pot culture experiments.** Agric. Jour. India 17: 507–509. *Pl. 30.* 1922.—Great differences were obtained in the case of indigo plants raised in old and new pots. With similar soil and manurial treatment the growth in old pots was always greater than in new ones. The author calls attention to this source of error in all pot-culture work.—*A. Howard.*

660. Hutchinson, C. M. **The value of fermented green manures as tested at Pusa by the prevalued plot method.** Agric. Jour. India 18: 219–237. 1923.—The paper deals with the results obtained at Pusa in green manuring with sann-hemp (*Crotalaria juncea* L.) In this series, ¼-acre plots were cropped for 2 successive seasons without any differential treatment. Abnormal plots were left out in the subsequent experiments.—*A. Howard.*

661. Joyal, J. **Pourquoi cultiver les plantes racines?** [Why grow root crops?] Sci. Agric. 3: 292–293. 1923.—Benefits to be derived by growing root-crops, and methods, cost and most desirable varieties are discussed.—*T. G. Major.*

662. Kiesselbach, T. A. **Competition as a source of error in comparative corn yields.** Jour. Amer. Soc. Agron. 15: 199–215. 1923.—Data given may be considered as indicating the principle of unequal competition between adjacent hills or rows containing unlike sorts or unlike stands of corn. The degree of such competition varies with the intensity of the limiting factors for growth and the degree of difference between the crops compared. This variability would appear to make it impracticable to work out general formulae for correcting yields subject to systematic errors or variations in the favorableness of stands. The use of methods which avoid such sources of error is the only solution. This may be accomplished entirely or in part by (1) growing similar sorts, (2) using multiple row plots and discarding border rows wherever unlike sorts are adjacent, (3) planting a surplus of seed and thinning plants to a uniform stand while small, (4) basing yields upon all hills containing the full number of plants and surrounded by a normal stand. In the case of checked corn this is facilitated by space planting within the hill. (5) Varieties differing markedly in vegetative development may have different optimum planting rates and a reliable variety test may necessitate several rates of planting.—*F. M. Schertz.*

663. Klemmer, Martin. **Scientific feeding of the domestic animals.** Paul Fischer, Translator. *242 p., 94 fig.* Alex Eger: Chicago, 1923.—This book with its companion volume, Hygiene of the Domestic Animal, constitute the revised and enlarged edition of the original single volume, Veterinary Hygiene. In the belief that the greatest value of the book to American students lies in emphasizing the difference in thoroughness between German and American practice, the translator has confined himself to a literal rendition with only such added explanations as are necessary to the understanding of American readers. The subject is treated in 2 nearly equal sections entitled Feeding Stuffs, and Principles of Nutrition and Feeding. The 1st covers chemical composition, conservation and preparation of feeding stuffs, character and relative value of many grasses, legumes, roots, grains and by-products used as feed, and the chemical, biological, microscopical and bacteriological examination of feeding materials. The 1st part of Section II is a technical discussion of the theory of nutrition. The 2nd presents in considerable detail typical rations for working horses and oxen, growing colts, calves, lambs and pigs, fattening ruminants and swine, producing dairy cows and goats, and rations for dogs, rabbits, chickens, ducks, geese and fish. In an appendix are tables on the organic and inorganic composition of feeding stuffs.—*L. W. Kephart.*

664. Kunhikannan, K. **A useful plant for India.** Agric. Jour. India 18: 144–147. *Fig. 1.* 1923.—The possible value of Mesquite (*Prosopis juliflora*) in combating famines and in providing food for stock is discussed. A number of seedlings have been raised at Bangalore and appear to be doing well.—*A. Howard.*

665. Kuyper, J. **De stikstofmestoffen ammonsulfaatsalpeter en Ureum.** [The nitrogenous fertilizers ammoniumsulphatesaltpeter and urea.] Arch. Suikerindust. Nederland.-Indië 13: 21–25. 1923.—Fertilizers from the Badische Anilin und Sodafabriken were tried

and the following observations noted: Ammonium sulphate-saltpeter is very hygroscopic and acts much like ammonium sulphate. Urea is not quite so hygroscopic and can be kept in paper-lined barrels. No definite judgment can be passed now on either one. Both wash out of the soil easily while the high nitrogen content of both is favorable. Urea is to be preferred to Chili saltpeter, because explosion is not an element to be considered.—*Peter J. Klaphaak.*

666. Kuyper, J. **De waarde van salmiak als stikstofmetstof.** [**The value of ammonium chloride as fertilizer.**] Arch. Suikerindust. Nederland.-Indië 31: 1–4. 1923.—Experimentally it compared favorably with ammonium sulphate, and not being hygroscopic it can be kept easily in the tropics. It does not wash out of the soil and may be used with success instead of ammonium sulphate.—*Peter J. Klaphaak.*

667. Kuyper, J. **Suikervorming en rijping bij het suikerriet.** [**Sugar formation and ripening in sugarcane.**] Mededeel. Proefsta. Java-Suikerindust. 1922: 195–321. 1922.—The 1st part discusses sugar formation and its dependence on chlorophyll and light energy. As the amount of light energy is constant, deep green leaf color, a spreading leaf crown, and broad leaves are of advantage. Planting distance should be adjusted to cover the entire surface with leaves. Tying up stalks to prevent lodging is of no advantage, as the power of production is considerably lessened by bunching the leaves. Under similar conditions high weight of cane is accompanied by low sugar yield, and a low weight of cane by a high sugar yield. Early harvesting is less hazardous than late harvesting.—The 2nd part deals with ripening. Sample-taking is discussed; it is advised that sampling places be selected and staked long before taking the samples, thus rendering the system automatic and not selective. It is immaterial whether the stalks come from 1 or more stools. Sampling is best done by cutting the stalks into 3 equal pieces. Division into 10 pieces gives better results, but is too laborious; division into 2 parts loses the most important result of the method, which is the relation between ripening and sugar-content of different parts of the stalk. The method is practicable for all cane varieties as proved by examples. It is found that ripening depends on time of planting,—more strikingly so in one variety, e.g., 100 P. O. J., than in another, e.g., 27 B., and more distinct in one plantation than in another. In Java there are 2 groups of plantations: (1) those in which soil and climate in the East Monsoon make possible a slow ripening; here early and late planting result in the same sugar content; (2) those in which soil and climate in the East Monsoon at first hasten ripening and then suddenly interrupt it. Here later planting results in lower sugar content.—Glucose follows the same changes as saccharose; no advantage is therefore obtained by determining it. Obtaining the specific weight at intervals has not contributed to determining the time of ripening.—Varieties 100 P. O. J., 247 B., E. K. 28, D. I. 52, E. K. 2, 979 P. O. J., 221 B. were mainly used in the determinations.—*Peter J. Klaphaak.*

668. Leake, H. M. **The trend of agricultural development in the United Provinces.** Agric. Jour. India 18: 10–22. 1923.—The chief factor underlying agricultural development in the United Provinces is the water supply. The possibilities of increasing the amount of water for crops is discussed and the conclusion reached that the best direction of progress is the utilization of the vast subterranean supply which underlies a great part of these Provinces. The best methods of utilization of this underground water are considered, including the use of mechanical power, which appears to be the most suitable method of raising water for agricultural purposes. The necessary capital is a consideration and the author holds that the large landholder should supply the capital and install small irrigation projects for his tenants on a profit-sharing basis.—*A. Howard.*

669. Love, H. H. **The importance of the probable error concept in the interpretation of experimental results.** Jour. Amer. Soc. Agron. 15: 217–224. 1923.—A careful consideration of the probable error concept is urged for all interested in experimental work. Where the probable error seems to fail, it is possible that methods need revision.—*F. M. Schertz.*

670. McDonald, A. H. E. **Conservation of fodder. Pit silage for starving stock.** Agric. Gaz. New South Wales 34: 533–545. *3 fig.* 1923.—The pit silo is discussed in a popular manner as a means of conserving forage in times of scarcity. Wheat, barley, and oats make the best silage just after heading, and these are the most useful crops in the western districts. Wild oats, maize, and sorghum are also recommended. Certain farmers have had success using alfalfa as a silage crop in pit silos.—*L. R. Waldron.*

671. McFadzean, J. S. **Soldier-settlers' farm competition, Leongatha.** Jour. Dept. Agric. Victoria 20: 365–377. 1922.—Fifteen competitors who had been working their properties for dairying for less than 2 years qualified for the prize. A full list of the points allowed in each case is given.—*Mary R. Burr.*

672. Makin, R. N. **Boys' sorghum growing competition at Bolong.** Agric. Gaz. New South Wales 34: 557–558. 1923.—A maximum yield of over 38 tons of green material was secured per acre. The prizes were awarded according to score-card results.—*L. R. Waldron.*

673. Matthews, F. **Field trials with feterita grain sorghum. Coonamble experiment farm.** Agric. Gaz. New South Wales 34: 555–556. 1923.—A yield of 40 bushels of clean seed per acre was obtained. An irrigated field of maize similarly grown failed to produce seed.—*L. R. Waldron.*

674. Metzger, J. E. **Sweet clover for summer pasture and green manure.** Maryland Agric. Exp. Bull. 253. *37–46, 2 fig.* 1923.—Sweet clover (*Melilotus alba*) for hay, pasturage, and green manuring purposes is discussed. Experiments showed that where 2 crops of wheat are grown in succession, 1 of sweet clover can be grown between them to advantage. In a 3-year test, yields of 1.4–1.51 tons of dry matter per acre were obtained. The crop was calculated to return to the soil on the average, in pounds per acre, 73.8 N, 13.69 P, and 52.72 K. Hubam clover grew taller than the white biennial but did not yield as much forage. Plants of both types survived the winter and began growth about the same time in the spring.—*J. T. Rosa.*

675. Mullett, H. A. **A study of the wheat yields in the Wimmera and Northern Districts, illustrating some factors controlling the progressive improvement in the efficiency of a country's agriculture.** Jour. Dept. Agric. Victoria 20: 321–337. *Illus.* 1922.—Progress in wheat growing from the pioneer days to the present has followed the introduction of superphosphate and the use of drills, the adoption of summer fallow practice, the introduction of Federation wheat, and the educational work conducted by the "scientific lead." In the Northern District, where there is a general resistance to the "scientific lead" the increase in yield of wheat over the same period has been only 32 per cent as compared with 151 per cent in the Wimmera.—*Wm. E. Lawrence.*

676. Mullett, H. A. **Benalla fallow competition, 1921.** Jour. Dept. Agric. Victoria 20: 406–410. 1922.—Summer fallowing increases the yield of wheat about 6 bushels per acre in land with 26 inches rainfall. Late (Oct.) and deeper plowing is recommended. Other recommendations are "early harrowing of the fallows after the first ploughing; cultivation of the fallow early after heavy rains before the land dries out; reduction of the use of the disc cultivator, which breaks the land down too fine, especially if worked on dry land; the use of the spring-tooth cultivator for working fallows where possible. This implement leaves the clods on the surface, and sifts the finer earth below."—*Wm. E. Lawrence.*

677. Mullett, H. A. **Crop and fallow competition, Horsham, 1921.** Jour. Dept. Agric. Victoria 20: 400–406. *Illus.* 1922.—Yields of 40 bushels per acre were common in a year when the rainfall was 19.4 inches, of which 11.6 inches fell during the growing period for wheat,–June–Nov. at Horsham. Twenty years ago 20 bushels per acre was considered a good crop. The increased yield is attributed to the following factors: "First there came super-phosphate, then fallowing, then Federation wheat, then thorough cultivation, heavier seeding, and finally late sowing."—*Wm. E. Lawrence.*

678. Mullett, H. A. **Crop and fallow competition, Rupanyup, 1921.** Jour Dept. Agric. Victoria 20: 194–204. *Illus.* 1922.—These competitions are said to have improved the excellence of most of the seed-wheat grown. Sheep are very useful in compacting the under layers of Wimmera soils.—*Wm. E. Lawrence.*

679. Mullett, H. A. **Geelong Farm competition.** Jour. Dept. Agric. Victoria 20: 739–761. *Illus.* 1922.—This report contains a statement of the aim of the competition and the results obtained.—*Wm. E. Lawrence.*

680. Mullett, H. A. **Inter-district farm competition for the Mallee.** Jour. Agric. Victoria 20: 449–471. *18 fig.* 1922.—This is the report of the Royal Agricultural Society's third competition (1921–1922).—*Wm. E. Lawrence.*

681. Myers, C. H., and F. R. Perry. **Analysis and interpretation of data obtained in comparative tests of potatoes.** Jour. Amer. Soc. Agron. 15: 239–253. 1923.—The work done in standardization of field technique involved in comparative tests of potatoes is somewhat contradictory, but indicates that the effect of competition must be taken into consideration. Comparative studies made have established the fact of competition and indicate that it may vary with varieties and conditions.—*F. M. Schertz.*

682. N[ewman], L. H. [Rev. of: Weatherwax, Paul. **The story of the maize plant.** *247 p.* Univ. of Chicago Press: Chicago, 1923 (see Bot. Absts. 12, Entry 4990).] Sci. Agric. 3: 420. 1923. [See also Bot. Absts. 13, Entry 861.]

683. Nolte, O. **Beiträge zur Klärung neuerer Düngungsfragen.** [Contribution to the elucidation of recent fertilizer questions.] Mitteil. Deutsch. Landw. Ges. 38: 449–453. 1923.—Green and animal manure production in Germany is at present insufficient to meet crop requirements; there is also a phosphate shortage. Substituting inorganic nitrogen for stable and green manures is discussed and the results of 70 years' experience at the Rothamsted Experiment Station are cited to show that such a substitution is not accompanied by a material decrease in crop yields. Practical experience has demonstrated that increasing amounts of plant food give results more nearly in accordance with the "ideal increase in yield curves" of Liebig and Russell than with that of Mitscherlich. In the opinion of the author there is little danger that the use of so-called physiologically acid fertilizer salt such as $(NH_4)_2SO_4$ and KCl will in general result in injuriously acid soils.—*K. D. Jacob.*

684. Pieters, A. J. **Clover failure.** Sci. Agric. 3: 408–411. 1923.—Clover failure is stated to be the chief forage crop problem in the northeastern U. S. A. "Clover sickness" was reported as early as 1747 by Jared Elliott. There has been a considerable reduction since 1900 in the area producing clover. The problem is discussed under the following heads: soil conditions, poor or unadapted seed, and diseases and insects. Where lime, phosphorus, and potash are present in sufficient available quantities, clover can be grown, but when these elements are deficient they must be added. Much loss has been caused by the use of unadapted foreign seed. Anthracnose, root rot, stem rot and winter-killing probably cause much of the loss; consequently, the development of a hardy, disease-resistant strain of double-cut, smooth, red clover is much desired.—*T. G. Major.*

685. Pieters, A. J. **Forage crop problems of the northern United States.** Sci. Agric. 3: 405–408. 1923.—In the area under discussion more than 30 per cent of the land devoted to harvested crops produces hay and fodder, and 75 per cent produces feed for livestock.—New strains of timothy are being developed at the government breeding station for timothy. Hardy varieties of alfalfa for the northern part of the area, and types adapted to the humid eastern part are required.—With sweet clover the most important problem is utilization.—On the Northern Great Plains the deficiency of rainfall is the most important problem.—The pasture problem in the Eastern States has not been given sufficient attention.—*T. G. Major.*

686. Ramsay, J. T. **Potato experiments, 1921–1922.** Jour. Dept. Agric. Victoria 20: 415–417. 1922.—Statistics are presented on seed selection, immature and ripe seed, variety and fertilizer test.—*Wm. E. Lawrence.*

687. Ramsay, J. T. **Result of manure trials on potatoes under irrigation.** Jour. Dept. Agric. Victoria 20: 87–90. *Fig. 1–3.* 1922.—It is pointed out that potatoes are a desirable rotation crop with lucerne on irrigated lands and that potato digging machines leave the ground in better condition and freer from weeds than hand harvesting.—*Wm. E. Lawrence.*

688. Remy, Th. **Beiträge zu den Grundlagen des Gras- und Kleebaues.** [Contributions to the principles of grass and clover cultivation.] Landw. Jahrb. 58: 655–690. 1923.—A study is presented of the growth of grass, clover, and alfalfa with and without fertilizers, and also of the amount of nutrients stored in the underground and above-ground parts of the plants.—*S. A. Waksman.*

689. Salmon, S. C. **Some limitations in the applications of the method of least squares to field experiments.** Jour. Amer. Soc. Agron. 15: 225–239. 1923.—The most serious difficulty in applying the method of least squares is the necessity for extensive repetition. Other errors are pointed out.—*F. M. Schertz.*

690. Sayer, W. **Mill trials of selected Coimbatore sugar-cane seedlings.** Agric. Jour. India **18**: 249–256. *Pl. 4.* 1923.—Mill trials of Co. 210, Co. 213, and Co. 214 are described. All of the 3 varieties did better than Hemja, the local variety, and arrangements have been made to distribute the new varieties to local growers.—*A. Howard.*

691. Sethi, D. R. **The reclamation of the desert area of the Kapurthala State.** Agric. Jour. India **17**: 546–550. *Pl. 32.* 1922.—A very large part of the State of Kapurthala in the Eastern Punjab consists of uncultivated, light, sandy soil. There are, however, water-bearing sands at some distance from the surface. As the subsoil water was found to be free from alkali salts, an experiment was undertaken to reclaim these sandy soils with green manure and by means of water raised by a tube well. Sann hemp (*Crotalaria juncea* L.) proved to be the most suitable crop for green manure. The soil was further improved by the addition of clay with the irrigation water. Good crops of maize, cotton, wheat, and sugar cane were raised on the reclaimed land. The work, however, has not gone far enough for the economics of a tube well to be worked out. This is necessary before reclamation can be taken up on a large scale.—*A. Howard.*

692. Shepherd, A. N. **Rice-growing on the Murrumbidgee irrigation areas.** Agric. Gaz. New South Wales **34**: 583–587. *3 fig.* 1923.—The crop was planted Sept. 28 on heavy red clay. Submergence was done Nov. 22 and continued until Feb. 26 and later dates, for the different plats. The plats were harvested Apr. 5–18, using a combined reaper-thresher. A maximum yield of 76 bushels per acre was secured, the quality being satisfactory.—*L. R. Waldron.*

693. Smith, Temple A. J. **The cultivation of hops.** Jour. Dept. Agric. Victoria **20**: 232–235. *2 fig.* 1922.—With improved methods of growing and curing, and the use of new varieties suited to soil and climate, Victoria hops equal or excel those of Tasmania. The valley of the Ovens River in northeastern Victoria is now growing the bulk of the hops produced.—*Mary R. Burr.*

694. Squire, M. J. E. **Field experiments with cotton. Grafton Experiment Farm.** Agric. Gaz. New South Wales **34**: 588. 1923.—The variety Lone Star was seeded Oct. 5 on upland in 3-foot drills. Plants were thinned to 8 inches apart. The plot was in full bloom in January when the plants were 18–24 inches tall. Three pickings were made and a yield secured of 444 pounds per acre.—*L. R. Waldron.*

695. Stanton, T. R. **Naked oats.** Jour. Heredity **14**: 177–183. *3 fig.* 1923.—Rather fragmentary data are presented on the relative yield of naked and hulled oats in comparative field experiments, indicating rather definitely that naked oats cannot compete successfully with common hulled oats in yield. A description is included of naked oats with brief discussions of their origin and mode of inheritance of the multiflorous character in naked-hulled crosses.—*T. R. Stanton.*

696. Summerby, R. **Replication in relation to accuracy in comparative crop tests.** Jour. Amer. Soc. Agron. **15**: 192–199. 1923.—Replication is much more effective in reducing error than is a change in either the size or shape of plots. Within the limits of the size and shape of plots and number of replications used in these experiments it does not seem possible to reduce the probable error below 2 per cent and to measure differences in yield of less than 6 per cent with certainty, unless 8–16 replications are made.—*F. M. Schertz.*

697. Taylor, C. S., and M. Ghosh. **Experiments on the green-manuring of rice.** Agric. Jour. India **18**: 104–114. *Pl. 2.* 1923.—These experiments owe their inception to observations made on the deficiency of phosphoric acid in the soils in the south of the Bhagalpur District of the Province of Bihar and Orissa. Accordingly, a series of experiments was carried out to ascertain whether crops would respond to phosphoric acid fertilizers. In pot cultures, superphosphate had a remarkably good effect on gram (*Cicer arietinum* L.) Phosphates and green-manure gave good results with rice on a field scale.—*A. Howard.*

698. Thomas, R. G. **Present and probable future distribution of wheat, sheep, and cattle in Australia.** Jour. Dept. Agric. Victoria **20**: 386–392. *3 maps.* 1922.—The wheat-growing area in Australia is very limited. The area forms a crescent-shaped strip some distance inland and approximately parallel to the coast line. The most important natural factor limiting the area devoted to wheat growing is rainfall, especially that falling during the growing season.

The degree of profitableness as compared with other agricultural and pastoral pursuits limits the area devoted to wheat more than temperature conditions. "At the same time there is evidently an optimum condition of temperature for wheat in Australia, as practically the whole of the area sown to wheat is situated between the 60 and 65°F. isotherms, there being a marked coincidence between the 60° isotherm and the southern limit of the wheat belt." The 15-inch line of winter rainfall approximately separates the dry-farming from the more intensive farming area, with its closer settlement. Summer rain is mostly lost through evaporation, is apt to cause lodging of the crop and spread of rust. Practically all of the wheat is grown between the 15- and 20-inch lines of winter or growing-season rainfall, i.e., Apr.–Oct. The winter rainfall is less than 7.5 inches in the wheat-growing districts of certain parts of South Australia and Victoria. That wheat may be grown here is due to the cooler temperature and more reliable rainfall. In New South Wales the 10-inch line has not been passed because the rainfall is more variable and the higher temperature causes increased loss by evaporation.—Better methods of cultivation and increased use of drought-resistent varieties will extend the wheat belt somewhat. The present area of the wheat belt includes about 124,000,000 acres, of which approximately 9,000,000 were sown to wheat in 1918–19. "Since none of this is mountainous country and wheat is everywhere the principal crop, it might be expected that the area at present sown will be about trebled before this belt is utilized to anything like its full capacity. But apart from this area, there is in the probable wheat belt, indicated further inland an area of some 138,000,000 acres." The 2 areas aggregate 260,000,000 acres. It is expected that at least 40,000,000 acres of this area will ultimately be planted to wheat.—*Wm. E. Lawrence.*

699. Tulloh, I. M. **Nhill crop and fallow competition.** Jour. Dept. Agric. Victoria 20: 147–164. *5 fig.* 1922.—An increased yield of wheat is attributed to later planting. An extra scarifying of the fallow just before planting and the shorter growing season is the explanation offered.—*Wm. E. Lawrecce.*

700. Valentine, Max. **Tobacco for Victorians.** Jour. Dept. Agric. Victoria 20: 105–107, 223–225. 1922.—The author presents a brief discussion of the single leaf method and the whole plant method of harvesting Bright tobacco. The returns are generally greater when priming off each leaf separately as it becomes ripe, which method is being adopted in the most successful tobacco-raising districts.—*Mary R. Burr.*

701. Voelcker, J. Augustus. **The Woburn Experimental Station of the Royal Agricultural Society of England.** Jour. Roy. Agric. Soc. England 82: 276–297. 1921.—The season of 1921 was exceptionally dry and the soluble mineral manures did not become available as rapidly as usual. Wheat yields on manured and unmanured plots were the same. The yield of barley on the unmanured plots was 2 bushels below that of 1920. Applications of farmyard manure gave the highest yields of wheat and barley in the continuous cropping experiments. In the rotation experiments wheat after clover with corn-fed manure applications yielded higher than where cake-fed manure was applied. In the grass experiments the results were similar to those of 1920. Results are reported from pot cultures with (a) chromate and bichromate of potash on wheat after barley, (b) the action of chromium on barley, (c) the relative effects of lime and chalk, (d) the influence of silicates on wheat, (d) the influence of fluoroides on wheat, (d) the effects of chemically prepared versus natural forms of magnesium carbonate, (e) the effects of ferrous oxide on wheat, (f) leucite as a source of potash. Leucite for the single trial was found to give as great an increase in the crop as other sources of potash.—*A. C. Arny.*

702. Wenholz, H. **An improved score card for judging maize ears.** Agric. Gaz. New South Wales 34: 553–554. 1923.—Size and weight of ears, conditions of the seed as to dryness, plumpness, and soundness are given ½ the total weightings. "Fancy" points are minimized.—*L. R. Waldron.*

703. White, Thomas H. **Fertilizer, variety and seed selection experiments on Irish and sweet potatoes.** Maryland Agric. Exp. Sta. Bull. 251. *23 p.* 1923.—Continuous selection of large, medium, and small tubers for planting over a 5-year period is thought to have increased the per cent of small tubers in the crop grown continuously from small tubers, though in 1 case this was connected with increased mosaic infection. For the 5-year period, largest yields were produced by the "medium" seed, which weighed 2–3 ounces each. Varieties of the Rural

group proved more suitable for the fall crop than varieties belonging to the Green Mountain group. Results of a 3-year test of commercial fertilizers on the late or fall crop are presented. On plots where sweet potatoes were grown continuously for 18 years, no toxic effects were apparent and the yield was maintained nearly as well by chemical fertilizers as by stable manure applied annually.—*J. T. Rosa.*

704. Whittet, J. N. **Some valuable additions to our useful pasture grasses.** Agric. Gaz. New South Wales 34: 547–551. *3 fig.* 1923.—Popular and technical descriptions are given of 7 species of grass as follows: *Panicum antidotale, Rottboellia exaltata* (Kokoma grass), *Andropogon purpureo-sericeus* (Kolhapur grass), *Panicum maximum* (Rhodesian buffel grass), *Pennisetum cenchroides* (buffel grass), *Brachypodium pinnatum* (false brome grass), *Bromus marginatus* (slender brome grass). Kokoma grass makes a remarkably rapid growth as it has attained a height of 11 feet in 5 months. It is somewhat similar to Sudan grass though much coarser. It is said to be drouth resistant. Kolhapur grass is an annual, resists drought, and serves as a nurse crop to perennial grasses. The false and the slender brome grass are both good winter grasses.—*L. R. Waldron.*

705. Zade. **Betrachtungen über die Vergesellschaftung von Kulturpflanzen mit Samenunkraütern und über deren Bekämpfung durch Fruchtfolge. [The association of cultivated plants with annual weeds and control of the latter by crop rotation.]** Mitteil. Deutsch. Landw. Ges. 38: 283–285. 1923.—The author points out that radish, mustard, and *Avena fatua* appear in summer grain but not in dense growing winter grain such as winter rye, winter barley, lucerne, red clover, etc. They sometimes appear in winter wheat, depending on how densely the ground is covered in early spring. The reason is found in the fact that the seeds of these weeds require alternation of temperature to sprout and a close ground cover prevents this alternation, thus inhibiting germination of the weed seeds, which, however, remain dormant for many years. The rotation recommended is a winter grain followed by lucerne or clover for several years and then a hoed crop in which the weeds may start and be destroyed.—*A. J. Pieters.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

Carroll W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 734, 751, 757, 759, 790, 850, 891, 901, 905, 935, 957, 973, 981, 1024, 1044, 1082, 1091)

706. Anonymous. **Current topics and events.** Nature 111: 438. 1923.—An item in this section notes the dissolution of the Conjoint Board of Scientific societies formed by the Royal Society in 1915. The proposed publication of a world list of scientific serials will be carried out.—*O. A. Stevens.*

707. Anonymous. **History of the Dahlia.** Gard. Chron. 72: 204. 1922.—Attention is called to the frequent statement that the Dahlia was introduced into England in 1789. This date given by Aiton, Hort. Kew, 5: 1813, was a misprint for 1798, and was corrected by Aiton in the epitome of the 2nd edition in 1814.—*P. L. Ricker.*

708. A., A. E. **Adrian Brown.** Proc. Roy. Soc. London B 93: iii–ix. 1922.—This is an obituary notice and appraisal of this biochemist, known for his work on fermentation and permeability of barley grains.—*P. B. Sears.*

709. Aerdschot, P. Van. **Travaux botaniques publiés en Belgique ou par des botanistes belges en 1921 et 1922. VIII. [Botanical articles published in Belgium or by Belgian botanists in 1921 and 1922.]** Bull Soc. Roy. Bot. Belgique 55: 205–224. 1923. [Also issued separately paged 1–20.]

710. Beauverie, J. **L'histoire de la phytopathologie. [History of phytopathology.]** [Rev. of: Whetzel, H. H. **An outline of the history of phytopathology.** *130 p.* W. B. Saunders Co.: Philadelphia, 1918.] Rev. Path. Vég. et Entomol. Agric. 10: 82–87. 1923.

711. Brotherston, R. P. **A compendious herbal.** Gard. Chron. 72: 352. 1922.—Numerous extracts on plants and their uses are given in this herbal published by John Archer in 1673.—*P. L. Ricker.*

712. Brotherston, R. P. "Gordon's Gardening." Gard. Chron. 75: 120. 1923.—Notes are given on the planters', florists' and gardeners' pocket dictionary by James Gordon, Edinburgh, 1774, from a copy owned by the writer—the only one he has ever been able to locate.—*P. L. Ricker.*

713. Brotherston, R. P. **Patrick Niell, LL.D.** Gard. Chron. 73: 320. 1923.—He was born in 1776 and came from a celebrated family of printers and type founders who lived near the present Edinburgh Royal Botanic Gardens. He was secretary of the Royal Caledonian Horticultural Society for over 40 years. His horticultural writings are listed with notes.—*P. L. Ricker.*

714. Fitzgerald, J. G. **Pasteur and the science of bacteriology.** In: **The centenary of Louis Pasteur.** Sci. Monthly 17: 23–29. 1923.

715. Hendry, Geo. W. **Alfalfa in history.** Jour. Amer. Soc. Agron. 15: 171–176. 1923.—Alfalfa originally came from Mesopotamia where it grew some 200 centuries ago. It was then disseminated to Arabia. Later it was found in Egypt, then in Greece and finally in Italy. About 126 B. C. it was introduced into China. From Italy it was transferred to Paris and then to Germany and England in 1573. During the 15th century it was introduced into South America. During colonial days it reached New England. About the middle of the 19th century it was introduced into California from South America.—*F. M. Schertz.*

716. Hildebrand, Joel H. **Pasteur and the science of chemistry.** In: **The centenary of Louis Pasteur.** Sci. Monthly 17: 17–22. 1923.

717. Jacob, Joseph. **Garden Kalendars, No. 3. Various authors.** Gard. Chron. 72: 252–253. 1922.—A list is given of the principal Gardening Kalendars from 1664 to 1843, exclusive of those considered in the previous articles, with comments on some of the most noteworthy.—*P. L. Ricker.*

718. Lawson, Publius V. **Thure Kumulien.** Trans. Wisconsin Acad. 20: 663–668. *3 pl.* 1922.—An appreciation is presented of the work of a Swedish naturalist who spent the greater part of his life in a study of the fauna and flora of southern Wisconsin. Brief extracts from letters and newspaper articles, indicating the intimate relations which existed between Kumulien and many famous biologists, are given.—*E. Fisk.*

719. Rigg, Geo. B. **An old British herbal.** Bot. Gaz. 75: 318–320. 1923.—An old herbal by John Hill, M.D., dated 1756, which recently came into the possession of the University of Washington, is described.—*B. W. Wells.*

720. Savastano, Luigi. **Contributo allo studio critico degli scrittori agrari italici. Pietro dei Crescenzi.** [**Contribution to the critical study of Italian agricultural writers. P. dei Crescenzi.**] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acrieale 5: 1–132. *Fig 2.* 1919–1921.—This is a careful study of the various editions of the Liber Cultus Ruris of Pietro dei Crescenzi. In order to have a clear view of the meaning of the Liber, Savastano makes a careful study of the agricultural conditions of the time of the first publication in 1470. The fact is brought out that the book supplied the wants of practically all Europe, since it was rewritten and translated during a period of 29 years in the various European languages, in Florence, Louvain, Augsburg, Paris, Strassburg, Memmingen, Vicenza, Spira, Magonza, and Venice. Over 188 species of garden and medicinal plants are treated in the Liber, while various varieties are also given considerable attention.—*A. Bonazzi.*

721. [Sowerby, Arthur deC]. **Inception and aims of the China Journal of Science and Arts.** China Jour. Sci. Arts 1: 1–3. 1923.—This journal will appear 6 times a year as the organ of the China Society of Science and Arts, an outgrowth of an attempt by the author to establish a biological society in China. Articles in all fields of science are received. The subscription price is $6 gold (U. S. A.) or $10 (Mexican).—*C. W. Dodge.*

722. Stone, R. E. **The genetics of Jacob.** Jour. Heredity 14: 228. 1923.—The science of genetics is very modern but there early existed a large amount of practical knowledge relating to animal breeding. Although the Bible is often quoted to indicate that Jacob believed in the influence of maternal impressions there is evidence (Genesis 31: 8–14) showing that as early as 1746 (?) B. C. Jacob understood the results of cross breeding and presumably pure breeding as well. He also understood the importance of isolation and favorable environment. —*R. E. Stone.*

723. Trelease, William. George Lincoln Goodale. 1839-1923. Science 57: 654-656. 1923.

724. W., W. Louis Compton Miall. (Obituary notice.) Proc. Roy. Soc. London B 93: x-xix. 1922.

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 655, 675, 776, 777, 778, 781, 791, 799, 800, 804, 805, 808, 823, 871, 891, 1076)

725. Anonymous. **A forest fire prevention handbook for the school children of California.** Prepared by the Forest Service, U. S. Dept. Agric., and the State Forester, in cooperation with the Superintendent of Public Instruction of the State of California [Will C. Wood]. U. S. Dept. Agric. Misc. Circ. 7. *24 p., 25 fig., 1 map.* 1923.—This is a course of 5 lessons, telling of the forests of California, the effect of fires, the causes of fires, fire prevention, and how fires are detected and fought.—*A. H. Graves.*

726. Gundersen, Alfred. **Evolution in flowering plants.** Brooklyn Bot. Gard. Leaflets 11^9. *4 p.* 1923.—This is a concise, popular account of the probable lines of evolution among the flowering plants with respect to the seed, stem, leaf, flower as a whole, perianth, stamens and carpels.—*A. H. Graves.*

727. Kavina, Karel. **Botanika Zemědělská.** [Agricultural botany.] Vol. 1. *753 p.* Ministry of Agriculture of Czechoslovak Republic. 1922.—This is the first textbook of agricultural botany ever published in the Czech language. The subject matter is divided as follows: part 1, anatomy; part 2, morphology; part 3, physiology and ecology. The 2nd volume is to deal with special botany, agriculture, and forestry. The text is accompanied by many figures and colored plates, mostly original.—*Zdenek F. Klan.*

728. Lindholm, Peter William. **Beretning om Foreningen "Skolehaven's 20 aars virksomhed fra 1903–1923.** [Report of 20 years' activity from 1903 to 1923, of the society, "School Garden."] *118 p.* The Society Schoolgarden: Copenhagen, 1923.

729. McCubbin, W. A. **Plant pathology in the public school.** Sci. Agric. 3: 319–321. 1923.—The writer believes that the difficulties of giving children at least an elementary knowledge of the more common plant diseases may be overcome. The plan suggested includes a small illustrated text, a set of simple exercises to demonstrate the reality of fungi and their fundamental relations to human affairs, a collection of common diseases, and a set of 50 questions on those features of everyday life in which fungi and bacteria touch human affairs.—*T. G. Major.*

730. Sowerby, Arthur deC. **The value of biological research.** China Jour. Sci and Arts 1: 31–38. 1923.

731. Spencer, E. R. **To demonstrate protein grains.** Science 57: 693. 1923.—Freehand sections of the meat of the Brazil nut may be used for permanent mounts to show the protein grains.—*C. J. Lyon.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 838, 876, 885, 972, 990, 1047, 1050, 1052, 1104, 1213)

732. Balls, W. L., and H. A. Hancock. **Further observations on cell-wall structures as seen in cotton hairs.** Proc. Roy. Soc. London B 93: 426-440. 1922.—Cotton hair consists of spiral fibrils approximating 1000 upwards in number. The pattern of these spirals is predetermined during hair elongation and preserved by secondary thickening. Each growth ring therefore repeats the original spiral structure. The simple pits of the cell wall are a phase of this general structure while the external visible convolutions of the cotton hair are chiefly

determined by it. The fibrils themselves are thought to be related to molecular conformation of cellulose aggregates composing them; but the problem is recognized as a very difficult one. —*P. B. Sears.*

733. Bambacioni, Valeria. **Osservazioni sulla struttura del citoplasma in relazione con le fibrille del Němec.** [**Observations on the structure of the protoplasm in relation to the fibrillae of Němec.**] Ann. Botanica **16**: 1–8. *Pl. 1.* 1923.—The author repeats the experiments of Němec on the fibrous structures in plant cells which he considers as transmitting stimuli. She worked with *Cucurbita Pepo, Pisum sativum, Ricinus communis, Hyacinthus orientalis, Cicer arietinum,* the varieties Braunschweiger and Zittauer of *Allium cepa, Pteris biaurita, Lonchytis hirsuta, Microlepis platyphylla, Blechnum brasiliense, Scolopendrium vulgare,* and *Asplenium esculentum,* using the root tips of germinating seeds in the angiosperms and the root tips of adult plants in the pteridophytes. In the angiosperms studied, the fibrous structures are not so well differentiated as those reported by Němec, the short linear structures observed being walls of elongated vacuoles. In the cells of the plerome of the Pteridophytes the author always finds fibrous structures, which, however, do not correspond so regularly, as Němec describes, to similar structures in neighboring cells and do not therefore have the physiological function ascribed to them by Němec. Small granules of starch were occasionally found in these fibrous cords. The author considers these structures mitochondria.—*P. D. Caldis.*

734. Baumgärtel, O. **Das Problem der Cyanophyzeenzelle.** [**The problem of the Cyanophycean cell.**] Arch. Protistenk. **41**: 50–148. *Pl. 3.* 1920.—The author reviews the literature dealing with the nature of the nucleus, its structure and chemical composition; the chromatophores; the peripheral cytoplasm; granulations; "Chromatoplasma;" "Centroplasma;" plastids—endoplasts, epiplasts and ectoplasts, with their chemical composition, in relation to the following genera and species of plants: *Tolypothrix lanata, Chroococcus turgidus, C. varius, C. macrococcus, Gleocapsa, Merismopedia elegans, Galanthus, Triticum, Dicranochaete reniformis, Spirogyra crana, Phytophysa Treubii, Oscillatoria Froelichii, Symploca muscorum, S. muralis, Aphanizomenon flos aquae, Nostoc muscorum, Scytonema solitaria, Rivularia biolosettiana, Chamaesiphon curvatus, Elodea canadensis, Vallisneria spiralis, Hyacinthus orientalis, Tradescantia virginica, Microspora, Cladophora, Oedogonium, Plaxonema oscillans, Hydrodictyon, Oscillaria tenuis, O. princeps, O. limosa, O. anguina, Anabaena flos aquae, A. sp., Cylindrospermum majus, C. sp.* A critical discussion of the technical methods used in studying the Cyanophyceae, and a brief account of cell division are included. The bibliography comprises over 100 references.—*R. P. Hall.*

735. Belar, Karl. **Die Kernteilung von Prowazekia.** [**Nuclear division of Prowazekia.**] Arch. Protistenk. **41**: 308–320. *Pl. 14.* 1920.—The resting nucleus of *Prowazekia josephi* has a distinct nuclear membrane, and contains a heavily staining karyosome surrounded by homogeneous outer chromatin. In mitosis the solid karyosome breaks up into 2 chromosomes, while the outer chromatin appears to form the intranuclear spindle into which the chromosomes move. In the metaphase each chromosome divides, and the daughter chromosomes move toward the poles of the spindle which become somewhat enlarged. In the telophase each pair of daughter chromosomes fuses into a daughter karyosome, and constriction of the nucleus is completed giving rise to 2 daughter nuclei. Nuclear division is accompanied by formation of 2 new flagella and division of the blepharoplast. A review of the literature is included.—*R. P. Hall.*

736. Cannon, H. Graham. **On the nature of the centrosomal force.** Jour. Genetics **13**: 47–78. *4 fig.* 1923.—This is an elaboration of a hypothesis put forward by A. B. Lamb (Jour. Exp. Zool. 1908). If the centrosomes are oscillating synchronously and in the same phase, they repel one another, and the lines of force between them resemble those between opposite poles of a magnet. Chromosomes, or other particles, would be repelled from the centrosomes, if lighter than the surrounding medium; and attracted, if of greater density. It would follow that the lighter particles of an emulsion would be driven away from the centrosome, and form a viscous zone outside the sphere from which the particles have been cleared; and consequently the outer medium would stream in towards the centrosome to supply the place of the outwardly driven particles. This appears to agree with Chambers' account of the formation of the aster

and amphiaster in the egg of *Echinarachnius*. The hypothesis is also said to account for the fluid state of the spindle region at the time of its formation; the smaller size of the centrosphere in unequal cleavage; the arrangement of mitochondria, oil drops, and Golgi rods; and the passing of a nucleus back to the center of an aster.—If the chromosomes at metaphase are repelled from the centrosomes, and if their induced oscillations cause them to attract each other, then, in the opinion of the writer, they are analogous to vertical floating magnets which repel each other and are attracted by an opposite pole above. The calculated configurations of different numbers of such magnets are compared with published plates of chromosomes in which the individual chromosomes seemed to be of the same size and shape. Light particles being repelled to the surface of the egg will also repel the centrosomes, and thus tend to shorten the spindle and determine the position of the spindle in the cell. These points are stated to be confirmed by the experiments of Conklin and Chambers. The rotation of the sperm head, and the division of the cell cytoplasm are regarded as explicable on this hypothesis. The passage of chromosomes from the equator to the poles is thought to depend, either on an increase of their density to more than that of the surrounding medium, or to a decrease in density of this medium below that of the chromosomes.—*John Belling.*

737. Chambers, Robert, and Harold C. Sands. **A dissection of the chromosomes in the pollen mother cells of Tradescantia virginica L.** Jour. Gen. Physiol. 5: 815–819. *Pl. 1, fig. 1–9.* 1923.—Living unstained pollen mother cells of *Tradescantia virginica* were isolated in plant sap and saccharose solution and dissected by means of a "Chambers" pipette. It was found that in the metaphase spindle stage the spindle area was a hyaline, jelly-like mass less solid than the surrounding cytoplasm and distinctly separated from it. In the living material there is no evidence during metaphase of spindle fibers which form so prominent a feature in coagulated and stained preparations. The chromosome of the *Tradescantia* pollen mother cell was found to be an elastic, jelly-like, nodulated cylinder possessing a cortex which differed markedly in refractive index from its central core.—*O. L. Inman.*

738. Fischer, Martin H. **On the electrical resistance of phenol-water systems and of protoplasm.** Science 57: 724–727. 1923.—The high resistance characteristic of living protoplasm and the many phenomena of permeability, etc., can best be understood by considering that protoplasm is not a solution of protoplasmic material in water but of water in protoplasmic material.—*C. J. Lyon.*

739. Gates, R. R. **Chloroplasts and cells.** Nature 111: 635–636. 1923.—"There is evidence from several sources that the size of the chloroplasts in a cell is controlled and determined by the size of the cell, or, at any rate, that whatever determines the one also controls the other." Reference is made to the small chloroplasts found by Irma Anderson in variegated prothallia of *Adiantum*, and to the large chloroplasts found by Gates in *Oenothera gigas*, in tomato-nightshade grafts by Winkler and in *Lemna* by Bottomley. Randolph, in contrast to these, found intermediate sizes in striped varieties of maize.—*O. A. Stevens.*

740. Georgevitch, Pierre. **Sur le rôle du centrosome dans la cinèse.** [**On the rôle of the centrosome in mitosis.**] Compt. Rend. Acad. Sci. Paris 176: 1084–1085. 1923.—A study is made of 2 marine algae: *Padina pavonia* and *Stypocaulon scoparium.* It is believed that the nuclear membrane exercises an attraction for the centrosome. This is held to explain the difference in the formation of the cell-plate in the higher plants as opposed to the algae. In the latter instance the cell-plate can be formed only from the cytoplasm between the 2 nuclei.—*C. H. Farr.*

741. Gilbert, E. M. **Cytological studies on the lower Basidiomycetes. I. Dacromyces.** Trans. Wisconsin Acad. 20: 387–397. *1 pl.* 1922.—The nuclear behavior during the formation of the basidium and spores is covered. The nuclei of the hyphae and spores contain 4 chromosomes. Fusion followed by division and chromosome reduction takes place in the basidium. Two of the 4 nuclei function as nuclei for the 2 spores, while the 2 remaining nuclei degenerate. Spores may remain 1-celled for a time but more often become 8-celled.—*E. Fisk.*

742. Haupt, Arthur W. **Cell structure and cell division in the Cyanophyceae.** Bot. Gaz. 75: 170–190. *Pl. 7.* 1923.—Cyanophyceae studied included *Gleocapsa, Coelosphaerium, Oscillatoria, Phormidium, Lyngbya, Nostoc, Anabaena, Tolypothrix,* and *Rivularia,* the most favorable for study being *Anabaena circinalis.* Both whole mounts and microtome sections

2μ in thickness were used for the studies. The general view of previous investigators, working with unsectioned material, held that the Cyanophycean cell consists of a colored peripheral portion and a colorless central portion or "central body." Haupt finds no such differentiation into a central body or nucleus, but shows an undifferentiated protoplasm of a granular, highly vacuolate, non-reticulate type uniformly distributed throughout the cell. The peripheral portion possesses pigment held in solution in the protoplasm, and not organized into a peripheral chromatophore. The central portion contains a deeply staining substance which forms string-like masses somewhat resembling chromosomes, but without individuality or without chromatic and achromatic differentiation. Cell division is brought about by a centripetally growing wall, 2 approximately equal masses being formed from the central portion. Although the central portion is not organized as a nucleus it functions as such, while the peripheral region functions in photosynthesis.—*Wanda Weniger.*

743. Kornfeld, Werner. **Ueber den Zellteilungsrythmus und seine Regelung. [On the rhythm of cell division and its regulation.]** Arch. Entwicklungsmech. 50: 526–592. 1922.—The development of a single organ in relation to its rate of growth is not independent but depends on the general course of development of the whole organism. Hunger appears at first to act as a stimulus to cell division but later it retards the rate of division. The various cell division curves or rates are influenced by a certain general internal preparation acting as a releasing stimulus on the one hand and perhaps also by external stimuli on the other.—*John H. Schaffner.*

744. Kröning, Friedrich. **Studien zur Chromatinreifung der Keimzellen. Die Tetradenbildung und die Reifteilungen bei einigen Nematoden. [Chromatin behavior in germ cells. Tetrad formation and the maturation divisions in certain nematodes.]** Arch. Zellf. 17: 63–85. *Pl. 7–8.* 1923.

745. Lenior, Maurice. **Le matériel nucléolaire pendant la télophase de la cinèse somatique dans le nucelle chez Fritillaria imperialis L. [The nucleolar material of the telophase of the somatic mitosis in the nucellus of Fritillaria imperialis.]** Compt. Rend. Acad. Sci. Paris 176: 1648–1651. 1923.—A study is made of the changes in the chromosomes during anaphase, telophase, and interphase. For sake of clearness in description, telophase is divided into 3 stages: protelophase, eutelophase, and metatelophase. In anaphase it is found that the chromosomes are composed of 2 materials, the nucleoline on the inside and the reticuline on the outside. During eutelophase the nucleoline is substituted for the reticuline more or less completely, while in the metatelophase, which follows, the reticuline is found to predominate. In the change to the interphase the nucleoline gives rise to the chromatin network, while the reticuline forms the nucleoli.—*C. H. Farr.*

746. Litardiere, R. de. **Remarques sur la fixation au liquide de Merkel et sur certaines structures nucléaires soi-disant provoquées par les fixateurs à base d'acide osmique. [Remarks on the fixation by Merkel's solution and concerning certain nuclear structures provoked by fixation with osmic acid.]** Compt. Rend. Acad. Sci. Paris 176: 1495–1498. 1923.—This is a criticism of the paper by Overton [see following entry] in which no anastomosis of chromosomes is found in the telophase of nuclei in the roots tips of *Podophyllum peltatum* in material fixed in Merkel's solution, whereas they do occur when fixation had been made with Flemming's or Herman's solutions. The author repeated the work of Overton, finding that the formula for Merkel's solution given by Dop and Gautie gives very poor results, quite inferior to Bouin's solution; while the formula for Merkel's as given by Chamberlain gave good fixation, but not so good as Benda's solution. With the Chamberlain formula anastomosis of chromosomes was observed.—*C. H. Farr.*

747. Overton, J. B. **On the organization of the nuclei in the root tips of Podophyllum peltatum.** Trans. Wisconsin Acad. 20: 275–322. 1922.—The resting nucleus of *Podophyllum peltatum* does not in general contain a continuous reticulum, but the chromosomes can be distinguished as elementary alveolar-reticulate bands, often forming lobes in the nucleus. These bands appear to be made up of 2 stainable substances, a linin framework, in which the more stainable chromatic substances are impregnated. The chromatin thus often appears in the form of definite chromosomes. No karyosomes or prochromosomes are present in the resting nucleus. A reticulum does not arise by a lateral anastomosing of the telophasic chromosomes

as held by Gregoire and others, but the final nuclear reticulum is composed of a number of elementary reticula in juxtaposition. Each telophasic chromosome is for a time apparently surrounded by its own membrane. As each chromosome undergoes an irregular alveolation to form an alveolar-reticulate structure of the resting nucleus, the membranes between adjacent chromosomes are broken down by the interosculation of neighboring vacuoles. No continuous spirem is present at any stage. During the prophases a recondensation occurs to form zigzag threads which split longitudinally by means of axial vacuolation, the split persisting until the chromosomes are separated at metaphase. The chromosomes are arranged on the spindle with their halves superposed and show a marked tendency to be arranged in homologous pairs, an arrangement which cannot always be seen during rest, but strong evidence is believed to exist of such pairing during metaphase. During the passage of the chromosomes from the equatorial plate to the poles each chromosome undergoes an irregular alveolation, the beginnings of which become evident as early as the metaphase, but the alveolation continues to increase through the anaphases and telophases until each chromosome forms an alveolar-reticulate structure of the resting nucleus. The anaphasic and telophasic alveolation has no relation to the longitudinal splitting of the chromosomes, this split being entirely prophasic. No evidence is found to support either Merriman's or Bonnevie's theories of chromosome structure and the results do not support the interpretations of Fraser and Snell, Lundegard, Digby and others as to the duality of nuclear structures.—*J. B. Overton.*

748. Policard, A., et G. Mangenot. **Recherches cytologiques sur l'état de L'huile dans les graines oléagineuses. La graine mûre.** [Cytological research on the physical state of the fats in oily seeds. The ripe seed.] Compt. Rend. Acad. Sci. Paris 176: 1841–1844. 1923.—A study of the fats in seed of *Ricinus*, using Scarlet Red and Indophenol Blue respectively as tests for oil, shows that here fat does not exist in the form of a very fine emulsion as Molliard held. The idea of Tschirch that the oil is mixed with the cytoplasm seems to be nearer the truth, but it is thought that he did not very clearly define his "ölplasma." It is here found that the oil accumulates in the cells in drops of various dimensions. This constant increase in the oil content of the cytoplasm, accompanied by a progressive dehydration, results in upsetting the colloidal equilibrium of the cell. There results an inversion from a diphasic system of oil in the aqueous cytoplasm to a diphasic system of aqueous cytoplasm in oil.—*C. H. Farr.*

749. Santos, Jose K. **Differentiation among chromosomes in Elodea.** Bot. Gaz. 75: 42–59. *Pl. 3.* 1923.—The cytological study of the male flowers of *Elodea gigantea* shows that the chromosome group in the cells of the male gametophyte contains 2 large elements which exceed both in length and in thickness any of the other chromosomes, and 1 element which is smaller than the rest. The method of reduction is telosynaptic. There are 24 haploid chromosomes which in the heterotypic division split so that one of the daughter nuclei receives 1 giant (L) chromosome, the larger of the unequal pair, and 22 autosomes, while the other daughter nucleus receives both a giant chromosome, and a very small one from the unequal pair, as well as 22 autosomes. In the homotypic division 2 of the 4 resulting daughter nuclei receive 1 giant (L), and 1 small (Y) chromosome, and 22 autosomes, while each of the other 2 receives 1 giant (L) chromosome, the larger member of the unequal pair (X), and 22 autosomes. Thus in the reconstruction of the 4 daughter nuclei, 2 of them contain more chromatin than the other 2; the resulting pollen grains, however, look alike. In the somatic mitosis there are 48 chromosomes, 2 of which are conspicuously longer than the others, while 1 is noticeably smaller. In the reduction, the 2 large chromosomes unite with each other, and the small chromosome unites with 1 of ordinary size. The presence and behavior of the large and small chromosomes in *Elodea gigantea* is similar to the conditions found by other workers in the ininsects *Drosophila, Lyganus* and *Euschistus*, and in the dioecious bryophyte *Sphaerocarpus*. The unequal pair of chromosomes bear sex characters, but the function of the large pair still remains to be determined.—*Wanda Weniger.*

750. Seifriz, William. **Phase reversal in protoplasm and emulsions.** Science 57: 694–696. 1923.—Both reversible and non-reversible emulsions are known and the more common colloidal substances in protoplasm fall into both groups. Hence theories of the mechanism of vital phenomena should take both cases into consideration. Furthermore, it remains to be conclusively proved that any lyophilic colloid (such as protoplasm) is a liquid-liquid or "emulsoid" system, as has been generally assumed for the case of protoplasm.—*C. J. Lyon.*

751. Täckholm, Gunnar. Zytologischen Studien über die Gattung Rosa. [A cytological study of the roses.] Acta Horti Bergiani 7: 97–381. *56 fig.* 1922.—The study covers all sections of the genus except the Laevigatae, Bracteatae, and Minutifoliae, 157 distinct forms being studied cytologically and a careful description given of each form. The identification of the material was checked by R. Matsson and S. Almquist. Täckholm is especially interested in the use of the chromosome number as a basis for determining the systematic position of the different species and varieties investigated. His results seem to show that the Caninae are sharply divided from all of the other sections of the genus. The Caninae are characterized by the remarkably constant appearance of either 7 paired chromosomes (gemini) and 14 unpaired chromosomes (univalents), or 7 gemini and 21 univalents, or 7 gemini and 28 univalents in the pollen mother cells; and 14 gemini and 7 univalents, or 14 gemini and 14 univalents in the megaspore mother cells. All other sections of the genus have 7, 14, 21, or 28 gemini and no univalents in reduction divisions of the species and species hybrids. In the Caninae there is a group of so-called aneuploid hybrids which the author considers recent crosses between the Caninae forms since the chromosome count is not a multiple of 7. Within the other groups the meiotic divisions show but few irregularities other than an occasional lagging of chromosomes on the spindle, or their being left out in the cytoplasm after nuclear reorganization, in the heterotype, homeotype, or both; this is especially true of the hybrids.—Reduction divisions in the Caninae follow the method observed by Rosenberg in *Drosera*. In heterotypic divisions of pollen mother cells 1 member of each of the 7 pairs of gemini moves to each pole; the univalents in the majority of cases and the halves either move to opposite poles or out into the cytoplasm and form dwarf nuclei which may later divide. In the heterotypic division of the megaspore mother cell the members of the 7 or 14 gemini are also separated to opposite poles, but the univalents proceed undivided to the micropylar pole and are split in the homeotypic division. Thus the 2 micropylar megaspores of the tetrad contain either 21 or 28 chromosomes and the 2 chalazal megaspores, which supposedly degenerate, 7 or 14 chromosomes. The micropylar megaspore is the one that is functional. The evidence seems to show that the systematic position of a species cannot always be determined from the chromosome number since the species of a section may have different chromosome numbers. In the Cinnamomeae, species with 14, 28, 42, and 56 chromosomes were observed. In several sections there are forms with 14 and others with 28 chromosomes. Furthermore, species resembling each other closely enough to be classed as varieties may have different counts, whereas other species belonging to widely separated sections may have an identical number of chromosomes. In addition, 1 circumpolar species, *R. acicularis*, Lindl., has forms with 28, 42, and 56 chromosomes respectively. Here is presented, then, an unorthodox case in contrast to the condition found in such genera as *Triticum* and *Chrysanthemum*, in which chromosome number and systematic position are rather definitely correlated. In roses there is no increase in chromosome size with each successive increase in count from the diploid to the octoploid state; the nucleo-cytoplasmic relation is maintained.—The 2nd half of the paper contain a theoretic discussion, and a comparison of the roses with other genera. An account is given of the occurrence of bivalents and univalents in the reduction divisions of other genera. There is a summary of the varying grades of "affinity" (pairing) between chromosomes in hybrids between parents having different chromosome numbers, as well as of the behavior of univalents during meiosis. The author deals at length with apomictical reproduction in the Caninae roses, and discusses under this head castration experiments of Dingler, Matsson, Harrison, Hurst, Schwertslager, and others on the various rose species, as conclusive proof of asexual reproduction in roses, and accepts Ernst's hypothesis that the cause of apogamy is hybridization. He attempts to demonstrate, on a cytological basis, the hybrid nature of roses reproducing asexually, holding that these are crosses between parent forms having different chromosome numbers. In the discussion of the origin of the hybrid and apomictical collective species of the Caninae, their phytogeographic range over Europe and a thin mountainous strip of Asia is indicated. The forms included in the cytological study represent the entire range. None of the present species can be considered as the ancient, sexually reproducing parent forms. Nor can these stem forms, on a taxonomic or cytological basis, be looked for among the species of other sections. Therefore, the parent forms were sexual Caninae roses which did not survive

the ice-age. The present Caninae are for the most part ancient F_1 hybrids reproducing asexually since the time of their origin in the preglacial or interglacial period. These F_1 hybrids, though facultatively sexual, have given rise to a large number of elementary species through a type of embryo mutation akin to bud-variation. Secondary crosses between these latter forms have produced ephemeral hybrids. Both of these phenomena account for the extreme polymorphy in the Caninae roses. A short discussion of the origin of polymorphism in other apogamic groups of plants concludes the paper. An extensive bibliography is appended.—[See also Bot. Absts. 12, Entry 3115.] *A. Gershoy.*

752. Wendel, Erich. **Über die Beziehungen zwischen Funktion und Lage des Zellkernes in wachsenden Haaren.** [On the relation between the function and position of the cell nucleus in growing hairs.] Beitr. Allg. Bot. 1: 45–80. *Fig. 1–11.* 1918.—In the single celled hairs on *Sinapis alba* seedlings, growth is first apical and later becomes basal. The position of the nucleus changes according to this change in the region of growth. In moist sand cultures the nucleus of the root hairs moves from the basal portion to the apical region, where growth is most active.—*Orton L. Clark.*

ECOLOGY AND PLANT GEOGRAPHY

George. D. Fuller, *Editor*

(See also in this issue Entries 648, 698, 785, 795, 967, 978, 1097, 1119, 1134, 1195, 1205, 1267, 1270, 1305, 1310, 1314, 1345)

GENERAL FACTORS, MEASUREMENTS

753. Anonymous. **Agricultural meteorology.** [Rev. of: Smith, J. Warren. **Agricultural meteorology.** *304 p., 8 pl., 88 fig.* The Macmillan Co.: New York, 1920.] Bull. Amer. Meteorol. Soc. 2: 35–36. 1921.—"This is the first book on the subject that has ever been published. * * The effect of climate on crop distribution and farm operations is shown. A small amount of space is devoted to the effect of weather on insects and plant diseases, as well as on seeds of different crops."—*Earl S. Johnston.*

754. Atkins, W. R. G., and M. V. Lebour. **The hydrogen ion concentration of the soil and of natural waters in relation to the distribution of snails.** Sci. Proc. Roy. Dublin Soc. 17: 233–240. *2 fig.* 1923.—Snails are more abundant numerically at pH 7–8 than elsewhere. Out of 27 species, 4 were found at pH 5, 20 at pH 7, and 14 at pH 8. Those with hyaline shells may be found in any portion of the range, but calcareous shells are limited to the alkaline end. Species increase from granite and quartzite regions as one proceeds to basaltic and finally limestone regions. Some puzzling cases remain in which soils with similar pH values, electrical conductivities, and aspects have a different snail fauna though within an area of 2 square miles.—*W. R. G. Atkins.*

755. Fuller, Geo. D. **Climates of the continents.** [Rev. of: Kendrew, W. G. **Climates of the continents.** *xvi + 387 p., 149 fig.* Oxford University Press: London, 1922 (see Bot. Absts. 13, Entry 759).] Bot. Gaz. 75: 216–217. 1923.—The reviewer believes this book will prove to be an invaluable aid to students of geobotany and "indespensible to all ecologists and to botanists interested in problems of distribution in which climatic factors are involved." [See also Bot. Absts. 12, Entry 2989.]—*B. W. Wells.*

756. Harshberger, John W. **The origin of columnar holes in wandering dunes.** Science 57: 727–728. 1923.—The holes are formed by the absolute decay of tree trunks imbedded in the sand. The compacted sand covers the top of the hole until disturbed.—*C. J. Lyon.*

757. Herzog, Th. **Die Pflanzenwelt der Bolivischen Anden und ihres östlichen Vorlandes.** [The vegetation of the Bolivian Andes and their eastern frontland.] Vegetation der Erde 15: viii + 258. *25 fig., 3 map.* 1923.—The volume begins with a historical sketch, a bibliography of 95 titles, and a chapter on the orography, hydrography, and geology of the country. Climatologically the region is divided into the valleys, with areas of equatorial and of summer rain, and the Andes, with areas of long rainy season, of short rainy season, of dry climate and of higher mountains. Data as to rainfall, temperature, and distribution of the

principal plant families are given. The hanging mosses *Squamidium leucotrichum, Pilotrichella flexilis, Meteorium illecebrum,* and *Phyllogonium fulgens* are characteristic of the mountain forest while the Sphagna are not so common as in European mountains. Tree ferns belonging to the genera *Dicksonia* and *Cyathea* are abundant while the zerophytic ferns include species of *Notochlaena, Chilanthes,* and *Pellaea. Zamia Brongniartii* is characteristic of the savannas. *Podocarpus* is the only important coniferous genus. *Carludovica palmata* reaches in Surututal the southeastern boundary of the sub-Andean region. The Scitaminaceae are confined to the macrothermic rainforest; *Heliconia* is in the forests of the valleys, *Costus* is in the mountain forests of 1500 m. and constantly accompanies *Chamaedorea.*—Epiphytic orchids from the genera *Oncidium, Odontoglossum,* and *Epidendrum* are numerous and the terrestrial species of *Sobralia* are along the thickets that border mountain meadows. Begonias abound, *B. parviflora* reaching the height of 4 m. *Cinchona* is represented by many species.—The principal floral areas are: (1) the western slopes of the Cordillera; (2) the Meseta Boliviana; (3) the high mountains of the Cordillera Real and Cordillera Oriental; (4) the eastern basins of the Andean mountainlands; (5) the northeast slopes of the Andes; (6) the eastern mountain chains; (7) the savanna frontland; (8) the Choco frontland.—There are extensive chapters on particular sections of the country giving detailed descriptions of the ecology and vegetation. Among the lists of plants some are arranged according to the growth forms, others on the basis of the formation types in which they occur. The author has drawn not only upon his own observations but also upon those of others. The photographs give clear ideas of the plant associations. —*J. C. Th. Uphof.*

758. Homén, T., and others. **East Carelia and Kola Lapmark.** Fennia. Bull. Soc. Geog. Finlande 42[3]: i–xvi + 1–264. *13 maps, 61 fig.* 1921.—This publication constitutes a general survey, scientific, historical and economic, in English.—*W. R. G. Atkins.*

759. Kendrew, W. G. **Climates of the continents.** *12 mo, xvi + 387 p., 149 fig.* Oxford University Press: London, 1922.—This makes available in English a fairly adequate description of the actual climates of the earth considered regionally. The temperature and rainfall maps are numerous and easily read, giving the seasonal as well as the annual distribution of these factors in a way that should be helpful to students of plant geography. A bibliography is appended. [See also Bot. Absts. 13, Entry 755.]—*Geo. D. Fuller.*

760. Lynch, R. Irwin. **Acclimatization.** Gard. Chron. 72: 224–225. 1922.—Attention is called to the varying use of the word and the statement is made that the natural distribution of plants has been little affected by attempts at acclimatization, which can only be obtained through a long course of descent. Instances such as *Opuntia* obtaining a rapid foothold in Australia are regarded as naturalization rather than acclimatization. As an example of the latter is cited a large bed of Deodars at Cambridge, all but 2 of which were winter-killed in the severe winter of 1879–80. They still survive, and if they bear seed would probably be of a hardy type. The editor questions the statement that no American apples succeed in England. Quotations are given from Darwin. The question is raised whether the acclimated plant is of practical value.—*P. L. Ricker.*

761. Vries, Hugo de. **Age and area.** [Rev. of: Willis, J. C. **Age and area: a study in geographical distribution and origin of species.** *x + 258 p.* University Press: Cambridge, 1922.] Jour. Heredity 14: 265–270. 1923.—By means of ample statistical researches on the geographical distribution of plants Willis has shown that the area occupied at any given time, in any given country, by any group of allied species at least 10 in number depends chiefly, so long as conditions remain reasonably constant, upon the ages of the species of that group in that country, but may be enormously modified by the presence of barriers such as seas, rivers, mountains, changes of climate from one region to the next, or other ecological boundaries, and the like; also by the action of man, and by other causes. From this result, presented in a series of tables he concludes that the dispersal of plants is governed by general laws and independent of so-called adaptations or of any kind of advantageous response to local conditions. The main factor of distribution is age, a cause which works in the same manner on all plants. The rate of expansion of area is a fair measure of age. The most widely distributed genera and species in every family are to be considered as the oldest within that group, and, taken broadly, the remaining ones must be the younger, the smaller the area they occupy. [See also Bot. Absts. 12, Entries 4851, 5466.]—*Hugo de Vries.*

VEGETATION

762. Brenner, Widar. Studier över vegetationen i en del av västra Nyland och dess förhållande till makrbeskaffenheten. [Studies on the vegetation of Western Nyland (South Finland) and its relation to the quality of the soil.] Fennia. Bull. Soc. Geog. Finlande 43^2: 1–105. 1921 [1922].—The Finnish paper is accompanied by a 5-page resume in German.—*W. R. G. Atkins.*

763. Cajander, A. K., und Yrjö Tlvessalo. Ueber Waldtypen II. [Concerning forest types.] Fennia. Bull. Soc. Geog. Finlande 43^3: 1–77. *10 fig.* 1921 [1922].—This constitutes a detailed ecological study.—*W. R. G. Atkins.*

764. Denniston, R. H. A survey of the larger aquatic plants of Lake Mendota. Trans. Wisconsin Acad. 20: 495–500. *1 map.* 1922.—A list is presented of 21 plants of common occurrence as observed at 44 stations in Lake Mendota. Data as to the abundance of plants at these various stations together with notes as to depths at which plants grow is given. *Chara* and *Cladophora* are included in the list.—*E. Fisk.*

765. Du Rietz, G. Einar. Studien über die Helianthemum oelandicum-assoziationen auf Öland. [Studies of the Helianthemum oelandicum-associations on Öland.] Svensk Bot. Tidskr. 17: 69–82. *Fig. 1–4.* 1923.—The statistical investigations in this paper were undertaken mainly in order to determine the minimum area (Minimiareal, Du Rietz, 1921) of the *Helianthemum oelandicum* associations on the island of Öland (Sweden). The associations occur on limestone flags covered with a very thin earth layer (alvar-ground). Three types of associations are distinguished: the "naked" association and those abounding in lichens or mosses. It was found that the minimum area probably lies above 1 and below 4 square m.—*O. Heilborn.*

766. Fischer, C. E. C. Santalum album, Linn. in the Chittoor District. Indian Forester 49: 428–429. 1923.

767. Fuller, Geo. D. The broad sclerophyll vegetation of California. [Rev. of: Cooper, W. S. The broad sclerophyll vegetation of California. An ecological study of the chaparral and related communities. Carnegie Inst. Washington Publ. 319. *124 p., 21 pl., 43 fig.* 1922 (see Bot. Absts. 12, Entry 3021).] Bot. Gaz. 75: 212–214. 1923.—After summarizing the major features of this work the reviewer says: "The organization of the material and its clear presentation, the abundance of quantitative data, the careful presentation of the dynamics of the situation, and the importance of the conclusions, all go to mark this as one of the most notable contributions to ecological science that has appeared during the past few years."—*B. W. Wells.*

768. Furrer, Ernst. Begriff und System der Pflanzensukzession. [The conception and system of plant succession.] Vierteljahrsschr. Naturf. Ges. Zürich 67: 132–156. 1922.—After discussing some fundamental notions of plant succession the author gives a scheme arranged under 7 groups. Two general series are recognized,—open pioneer successions, and closed vegetation successions. The 2nd is divided into 2 general series: those which soon pass out of the edaphic stage to the climatic climax (Klimatophile Serien), further divided into turf series (Rasenserien), thicket series (Gebüschserien), and forest series (Waldserien); and series beginning in water or on the shore and remaining in the edaphic condition for a long time (Edaphophile Serien), further divided into meadow to mesophytic forest series (Auenserien), those which through centripetal progression of the vegetation belts end in a grass meadow or woody plain (Verlandungsserien), and sand dune series both along flowing and standing water (Dünenserien). Each of the 7 series groups is further divided in considerable detail. The paper ends with a critical discussion of succession as worked out by Cowles, Clements, Gams, Luedi, and others.—*John H. Schaffner.*

769. Hannerz, Alf. G. Die Waldgrenzen in den östlichsten Teilen von Schwedisch-Lappland. [Forest limits in the eastern parts of Swedish-Lappland.] Svensk Bot. Tidskr. 17: 1–29. *Pl. 1, fig. 1–8.* 1923.—Travelling eastward through Scandinavia, Finland, and Russia one finds the upper limit of the birch forest sinking and that of the pine forest rising. The 2 limits probably cross each other somewhere, as the birch forest reaches the highest levels in Scandinavia and the pine forest apparently in Russia. According to Frödin (Lunds Univ. Årsskr. N. F., Avd. 2, 13^2: 1916) the region of intersection is found in Swedish-Lappland, in the eastern parts of which the pine forest ascends higher than the birch forest. Hannerz,

however, finds Frödin's views inaccurate, the figures and photographs of the latter investigator rather showing the birch forest to be the higher. From studies of Frödin's data and from travels in the region under consideration the author concludes that Frödin had investigated mainly low mountains where edaphic factors prevent the birch forest from reaching its climatic limit, this limit being reached on surrounding higher mountains. In east Lappland, as in the west, a broad zone of birches generally covers the mountains above the pine forest.—*O. Heilborn.*

770. Häyrén, Ernst. **Föroreningen och strandvegetationen i Helsingfors hamnområde.** [The foulness and shore vegetation in the harbor of Helsingfors.] Svensk. Bot. Tidskr. 17: 62–68. 1923.—The author states that the harbor of Helsingfors possesses a vegetation quite different from that found along the adjacent shores. The differences must depend on the foulness of the water, other ecological factors being equal. According to the terminology of Kolkwitz and Marsson (1908), 4 groups of species are distinguished: polysaprobe, strongly and weakly mesosaprobe, and oligosaprobe. The following prominent associations may be used for the practical determination of the degree of pollution of the water: (1) polysaprobe association of bacteria e.g., *Beggiatoa alba*); (2) strongly mesosaprobe association of *Enteromorpha crinita* with a white covering of bacteria, especially *Thiothrix* and *Sphaerotilus;* (3) weakly mesosaprobe association of *Enteromorpha crinita* and *E.* spp., without bacteria; (4) very weakly mesosaprobe association of *Ulothrix subflaccida;* (5) oligosaprobe association of *Enteromorpha Hopkirkii* and *E. clathrata.* When not even the last-mentioned species are found the water may be regarded as clean. The land vegetation of the shores is also influenced by the foulness of the water, the lichens, for instance gradually disappearing.—*O. Heilborn.*

771. Rickett, H. W. **A quantitative study of the larger aquatic plants of Lake Mendota.** Trans. Wisconsin Acad. 20: 501–527. 1922.—The attached plants in this lake at Madison, Wisconsin, grow in a continuous belt extending from the shore to a depth of about 5 m. By comparing the species found at different depths, it was found that the vegetation could be divided into 3 depth zones (0–1 m., 1–3 m., 3–5 m.), although the division lines were more or less arbitrary. The plant belt as a whole was divided into 41 stations, within each of which the growth was fairly uniform. Samples were gathered from measured areas of the lake bottom by swimming and, in the deeper waters, by the use of a diving hood. The samples in the various zones were averaged, giving the weight of each species per square m., both wet and dry. Areas were measured on the map, and the total weights of the various species computed from these data. More than ½ of the total vegetation is found in the middle depth zone. The flora includes *Vallisneria*, 5 species of *Potamogeton*, *Myriophyllum*, and *Ceratophyllum*, besides other less abundant forms; the 1st composes about ½ of the total. Some species are more or less restricted to shallow or to deep water, while others are equally abundant at all depths. Some species prefer a sandy to a muddy bottom, or vice versa, though growing to some extent in either. Other species thrive on all kinds of soil. In addition to the main plant belt, there are several bays characterized by a distinctive flora, which passes gradually into typical marsh vegetation. During early summer *Cladophora* is abundant on rocks near the shore. Some attempt was made to estimate the quantity of this alga from representative samples.—*H. W. Rickett.*

772. Rosberg, J. E. **Finska Landskapstyper.** [Finnish landscape types.] Fennia. Bull. Soc. Geog. Finlande 40[3]: 1–25. *Pl. 4, 24 fig.* 1919.—A geological and ecological survey is given, with special reference to the development of brackish water coast vegetation and to that of the great lakes.—*W. R. G. Atkins.*

773. Weisz, R. F. **Die Gipsflora des Südharzes. Eine Vegetationsskizze.** [The gypsum flora of the south Harz. A sketch of the vegetation.] Beih. Bot. Centralbl. II Abt. 40: 223–252. 1923.—The Bunter Sandstone of this region is Triassic. The gypsum soil is from the Zechstein, which also has dolomite and clay formations in it and belongs to the Permian. The Zechstein outcrop has some rare plants in it. Difference in topography influences plant distribution.—The gypsum flora is characteristically xerophytic as shown by deep strong roots, rhizomes, tubers and bulbs, fleshy leaves, rosette habit, hairy leaves and stems, etc. A number of dwarf varieties are listed in the meadow and rock communities.—*Pinguicula gypsophyla* and *Parnassia palustris* are characteristic members of this flora. *Pinguicula* is somewhat

restricted in distribution but *Parnassia* is everywhere.—About 200 species are listed in the beech forest society, 50 in the shrub or bush society, 175 in the meadow society, and 75 in the rock society.—*L. Pace.*

FOREST BOTANY AND FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 725, 763, 766, 767, 769, 910, 1004, 1268, 1308)

774. Anonymous. **A world timber famine.** Sci. Amer. 129: 158. 1923.—This is an editorial based upon the annual report of the British Forestry Commission.—*Chas. H. Otis.*

775. Anonymous. **Beleihung des Holzbestandes in Ungarn.** [Borrowing on timber in Hungary.] Deutsch. Forstzeitg. 38: 564. 1923.—In order to lessen the hardship on forest owners caused by recent restrictions on cutting, it has been provided that loans may be made up to 60 per cent of the value of forests, including both land and timber. Such forests must be handled in strict accord with approved plans, under penalty of being managed by the State at the owner's expense.—*W. N. Sparhawk.*

776. Anonymous. **Circulaires Ministérielles.** [Departmental circulars.] Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est 15: 39–41. 1923.—A circular from the French Minister of Agriculture to the Prefects calls attention to the importance of forest protection, better management of forests, productive utilization of uncultivated lands, and reforestation of the mountains. Many coppice stands should be converted into high forest. France is only 18 per cent wooded and has 7½ million hectares of uncultivated lands, which should be forested. Forest officers should cooperate with school teachers in forming children's forest societies to encourage interest in protection of trees and in reforestation. The Minister of Public Instruction addressed a circular with the same purpose in view to the local school authorities.—*Joseph Kittredge, Jr.*

777. Anonymous. **Demonstration courses in kiln drying, boxing and crating, gluing of wood, wood properties and uses.** (Prepared by the Forest Products Laboratory, Forest Service.) U. S. Dept. Agric. Misc. Cir. 8. *20 p., 12 fig.* 1923.—This is a description of courses of study in the above named subjects offered to the public by the Forest Service in cooperation with the University of Wisconsin at the Forest Products Laboratory, Madison, Wisconsin.—*A. H. Graves.*

778. Anonymous. **How a tree tells the story of forest fires.** Sci. Amer. 128: 183. *1 fig.* 1923.

779. Anonymous. **Statistique des forêts belges.** [Statistics of Belgian forests.] Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est 15: 42–43. 1923.—Forests in Belgium occupy 521,199 hectares or about ⅕ as much as the cultivated area and 17.7 per cent of the total area of the country. Tables show the areas of broad-leaved, coniferous, coppice-understandards, simple coppice, and planted forests by classes of ownership; also the areas of broad-leaved and coniferous forest by provinces. The reduction in area of productive forest caused by the war, amounting to 39,000 hectares, was nearly compensated by the annexation of the cantons of Eupen-Malmédy.—*Joseph Kittredge, Jr.*

780. Anonymous. **The all-devouring marine borer.** Sci. Amer. 128: 388–389. *4 fig.* 1923.—*Teredo navalis, Xylotrya* (*Bankia*), and *Pholas* are described in popular style, as well as the destruction of piling caused by these organisms, and remedial measures.—*Chas. H. Otis.*

781. Besley, F. W. **Thirty important forest trees of Maryland. How to know them.** *35 p., 30 fig.* State Bd. Forestry: Baltimore, Maryland, 1922.—Brief descriptions of 30 of the principal trees are given.—*W. N. Sparhawk.*

782. Bevan, W. **Timber exhibition.** Cyprus Agric. Jour. 18: 45. 1923.—An exhibit of Cyprus timbers, including 284 pieces of wood belonging to 26 species, is described. Three grades of wood were exhibited: (a) heartwood; (b) mixed sapwood and heartwood; (c) sapwood. Bay laurel, acacia, carob, true cedar (*Cedrus lebanotica* var. *brevifolia*), Troodos juniper (*Juniperus foetidissima*), and olive attracted special attention. Olive is especially suitable for inlay work in furniture.—*W. Stuart.*

783. Blanford, H. R. **Effect of wide spacing in teak plantations.** Indian Forester 49: 301–303. 1923.—Spacing teak 9 × 9 feet in plantations resulted in more forked stems, larger crowns, and greater diameter growth than in plantations where the 6 × 6 spacing was followed. The latter should have been thinned, which would have increased diameter growth. The closer spacing is to be preferred because of the resulting better formed trees.—*E. N. Munns.*

784. Buffault, P. **Rapport sur la question forestière et la reboisement dans la région Centre sud.** [**Forestry in central France.**] Compt. Rend. Congrès Assoc. Agric. 1922: 36–44. Brive, Aug., 1922.—*Pinus silvestris* is recommended for planting on siliceous soils; cedars and *Pinus halepensis* may be useful on warm, calcareous soils.—*J. Dufrenoy.*

785. Champion, H. G. **The interaction between Pinus longifolia (Chir) and its habitat in the Kumaon Hills.** Indian Forester 49: 342–356, 405–416. 1923.—The chirpine of India has an unusually high coppicing power, facilitating resistance to all forms of injury in early youth. Seed crops are heavy though erratic, and are eagerly sought by rodents and birds. Seedlings in the 1st year have a high mortality, though surviving readily in deep shade, and, as saplings, have a very rapid rate of height growth. The leaf fall is heavy, contributing to the inflammability of the forest; the tree stands fire well. Heavy turpentining is fatal. As a tree, the pine appears free from insect or fungus attack. Under forest protection the stands are becoming heavier and the form of the trees therefore better.—*E. N. Munns.*

786. Cook, H. O. **Forest mensuration. Tables for measuring logs, trees, and the growth of stands.** *69 p., 1 pl., 3 fig.* Massachusetts Dept. Conservation: Boston. 1921.—This is a compilation of data obtained by the State Forester and the Department of Forestry at Harvard University. Tables show: (a) the amount of lumber sawed from logs of oak, white pine, chestnut, yellow birch, beech, and sugar maple; (b) the volumes in board feet, cubic feet, or cords of standing trees of these species and also of red maple; (c) the yields per acre at specified ages for hardwoods and white pine; (d) the growth in volume and height of white pine and white spruce. Other tables show the results of sawing with band compared with circular saws; the comparative volumes of round-edge and square-edge lumber sawed from given logs; the relation between cubic feet of solid wood, caliper cords, and board feet of lumber; and the space occupied by loose and stacked fuel wood.—*W. N. Sparhawk.*

787. Dallimore, W. **Abnormal pine stems.** Kew Bull. 1922:204–206. *Fig. 1–2.* 1922.—In England certain abnormal growths in pine trunks are often caused by attacks of the "pine-shoot tortrix moth" (*Retinia buoliana*).—*T. J. Fitzpatrick.*

788. Frothingham, E. H. **Classifying forest sites by height growth.** Jour. Forest. 19: 374–381. 1921.—Height growth is a direct method of site determination but applicable only to the stand only when age data are available. It is widely applicable and with it growth potentialities of large areas may be estimated closely. Grouping of species and classification by groups permits unification of areas and species. Yield tables thus referenced may be readily compared and the productive capacity of lands judged in terms of species.—*E. N. Munns.*

789. Gazin, A. **La question du charme.** [**The question of hornbeam.**] Bull Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est 15: 43–45. 1923.—Lacking more valuable species, is it good silviculture to reserve hornbeam in the coppice-under-standards forests of eastern France? One solution would be not to reserve the hornbeam but to plant better species and then disengage the planted trees and any valuable species in the natural reproduction from the hornbeam sprouts at least 4 times in the succeeding rotation. If this is too expensive, hornbeam may have to be reserved. Hornbeam poles and standards are more valuable than coppice, and beech will come in under them better than in the midst of sprouts.—*Joseph Kittredge, Jr.*

790. Gerlings, Jager. **De ontwikkeling van den boshbouw in ons land gedurende de laatste 25 jaren.** [**The development of forestry in the Netherlands during the last 25 years.**] Cultura 35: 238–244. 1923.—Although there were few pine forests (*Pinus silvestris*) in the Netherlands 100 years ago, much pine has been planted subsequently and stands of it are now common. Planting was stimulated by the demand for mine timbers in Belgium (1870), the favorable railroad tariffs for such material (1880), and the organization (1899) of the Nederlandsche Heide-Maatschappij (Netherlands Heath Association). Pine grows rapidly and yields mine timber at a profit in 40–50 years. The total forest area increased 47 per cent

(169,026 to 248,685 hectares) during the period 1833–1921, while broad-leaved forest decreased 18 per cent and pine forest increased 325 per cent. At first the pine was sown; later, planting became the general practice, using 1-year and, more recently, 2-year seedlings. Chemical fertilizers have been used, and, since 1898, green manures, especially *Lupinus luteus*. Van Schermbeek showed the disadvantages of pure forests of one species and started mixed forests near Breda, using deciduous broad-leaved species.—*J. C. Th. Uphof.*

791. Graves, Henry S. **The study of forestry.** *10 p.* Gov't. Printing Office: Washington, D. C., 1922.—This report, prepared for the exhibit of the U. S. Forest Service at the Brazil Centennial Exposition, lists and describes briefly the 19 collegiate institutions in the U. S. A. which offer full technical courses in forestry. [Published also in Spanish and Portuguese.]—*W. N. Sparhawk.*

792. Hansen, T. Sh. **Second growth on cut-over lands in St. Louis County.** Minnesota Agric. Exp. Sta. Bull. 203. *50 p.* 1923.—Only 4 per cent of the area has failed to restock, as a result of repeated burning. Comparatively recent fires have resulted in the young stands predominating over much of the area. The young hardwoods grow approximately 1 foot and the conifers 8 inches in height a year. Over and under stocking causing slow growth and poor quality of wood result where new stands are left to chance. In the young stands hardwoods predominate. The county contains 1,090,046 acres of young hardwood and 545,023 acres of mixed growth. Birch and aspen are being produced in considerable amounts. Adequate fire protection is a prerequisite in securing profitable reforestation.—*A. C. Arny.*

793. Hawley, R. C. **Results secured in treating pure white pine stands on experimental plots at Keene, New Hampshire.** Yale Univ. School Forest. Bull. 7. *32 p.* 1922.—Measurements are given for 19 permanent sample plots remeasured at 5-year intervals for 15 years. Thinnings resulted in more rapid growth in diameter and volume on fewer stems, and stimulated height growth. Increased annual growth per acre resulted from thinnings, and the health of the stand was improved. Pine reproduction can be obtained by the shelterwood method of cutting.—*H. H. Chapman.*

794. Herrmann. **Der Kiefernbaumschwamm und seine Bekämpfung.** [**The pine rot and its control.**] Deutsch. Forstzeitg. 38: 653–655. 1923.—Available information is summarized regarding the mode of attack of *Trametes Pini*, its effect, and methods used in combating it. From 1904 to 1914, 6 million cubic m. of infected timber were cut in the Prussian state forests.—*W. N. Sparhawk.*

795. Hiley, W. E., and Norman Cunliffe. **An investigation into the relation between height growth of trees and meteorological conditions.** Oxford Forest. Mem. 1. *19 p., 3 pl.* Clarendon Press: Oxford, 1922.—In order to determine the relative importance of various meteorological factors influencing the height growth of trees, measurements were made twice a week of sample specimens of *Picea sitchensis*, *Pinus laricio*, *Larix europaea*, *Thuja plicata*, *Pseudotsuga taxifolia*, and *Fagus*, as well as a few measurements of several other species. Correlation coefficients were calculated between the daily height-increments and important climatic factors. The high coefficients between maximum air temperatures and growth of Corsican pine and Sitka spruce indicate that temperature is more important than all other factors combined in its influence on the rate of growth. For larch the correlation was evident only during a season when moisture was plentiful and mean temperatures did not rise above 66°F. The restriction of water supply by removing the top inch of soil reduced growth of larch, spruce, and pine 17, 19, and 13 per cent, respectively, while cutting half-way through the stem had little effect except on the pine. Studies of growth of Corsican pine from 1907 to 1921 showed a negative correlation between increment and May–June soil temperatures, and between increment and mean air temperature for the same period, and a positive correlation between increment and April–June rainfall. It is suggested that the improvement in rate of height-growth of a young plantation at the time its canopy becomes complete, and the retardation of growth when a stand is opened up too much, may be explained by the soil temperature relationship.—*W. N. Sparhawk.*

796. Howard, S. H. **Note on the afforestation of grassy banks in sal forests.** Indian Forester 49: 484–490. 1923.—Sowing of *Dalbergia sissoo* is useless in heavy grass without weeding, which is possible only during the rainy season. Shoot plantations become estab-

lished much more quickly and readily through transplants. *Pinus longifolia* is the most successful species in competition with heavy grass and requires no weeding. Seed is sown broadcast, but more successful results follow sowing in furrows. Pigs are exceedingly destructive and plantations must be fenced. Frost is an enemy of both species.—*E. N. Munns.*

797. McLeod, J. J. **Forestry. Its relation to agriculture and the state.** Agric. Gaz. New South Wales 34: 426–430. 1923.—The natural forests of Australia are composed mainly of hardwoods. Softwoods are limited to cypress pine [*Callitris robusta*] of the western and hoop pine [*Araucaria Cunninghamii*] of the northern coastal region. The supplies of these are totally inadequate for Australian requirements. The forests would have been many times more valuable had they been composed mainly of soft woods. Certain introduced species, such as California pine (*Pinus insignis*), will probably be more valuable under Australian conditions than under their native conditions. A plan is submitted for planting conifers on a large scale. —*L. R. Waldron.*

798. Maiden, J. H. **To raise Pinus insignis from seed.** Agric. Gaz. New South Wales 34: 587. 1923.

799. Mattoon, Wilbur R. **Common forest trees of Kentucky: how to know them.** *72 p., 70 fig.* State Dept. Agric.: Frankfort, Kentucky, 1923.—Seventy of the more common trees are briefly described in non-technical language.—*W. N. Sparhawk.*

800. Mattoon, Wilbur R., and Susan S. Alburtis. **Forest trees of the District of Columbia, including some foreign trees: how to know them, where to see them.** *64 p., 64 fig.* American Forestry Association: Washington, D. C., 1923.—Sixty-five of the more common native and introduced trees are briefly described, and information is given as to where specimens of each may be found within the District. A list is given of streets planted with particular species; also a brief list of trees of special interest.—*W. N. Sparhawk.*

801. Mehnert. **Nochmals der Dauerwaldgrubber.** [**More about the "Dauerwald"-grubber.**] Deutsch. Forstzeitg. 38: 641. 1923.—Harrowing the soil under pine stands resulted in excellent natural reproduction, with 20–200 seedlings to the running meter of harrowed strip. Mixing the raw humus and mineral soil is also expected to stimulate the growth of the stand.—*W. N. Sparhawk.*

802. Ram Nath. **A short note on the poplar (Populus euphratica) forests in Muzaffargarh District, Punjab.** Indian Forester 49: 490–496. 1923.—The poplar forests of this district cover 23,637 acres. The rotation has been fixed at 30 years with thinnings at 10, 20 and 25 years to get pole material. An insect borer and frequent grass fires do much damage to the stands.—*E. N. Munns.*

803. Nicholson, J. W. **The classification of government forests in India.** Indian Forester 49: 473–483. 1923.

804. Ormsbee, C. O. **The maple sugar industry. The tree that made Vermont famous, and how its delectable juice is harvested.** Sci. Amer. 129: 176, 214–215. *4 fig.* 1923.

805. Pack, Charles Lathrop. **The school book of forestry.** *159 p., 16 pl.* American Tree Association: Washington, D. C., 1922.—The author discusses in a popular way the growth of forests, forest conditions in the U. S. A., the economic importance of forests, forest fires and destructive insects and diseases, the forestry movement, organization of the federal and state forest services, and forest recreation. He urges the practice of forestry by public agencies, lumbermen, and farmers, as well as more efficient utilization of forest products by consumers. —*W. N. Sparhawk.*

806. Record, S. J. **An old friend in new dress.** Sci. Amer. 128: 318–319. *2 fig.* 1923.—The Turkish boxwood, *Buxus sempervirens*, is described, with its properties and uses and its various substitutes, among which are *B. Macowani, Aspidosperma, Casearia,* and *Phyllostylon.—Chas. H. Otis.*

807. Record, S. J. **Lignum-Vitae.** Yale Univ. School Forest. Bull. 6. *48 p., 7 pl., 2 fig.* 1921.—Part I is a botanical discussion of trees and woods of the lignum-vitae family, Zygophyllaceae. The 3 genera with arborescent species are *Guaiacum, Porlieria,* and *Bulnesia,* confined to tropical and subtropical regions of the Western Hemisphere. *Porlieria angustifolia* Gray, *P. Lorentzii* Engl., *P. hygrometrica* R. & P., *Bulnesia Retamo* Gris., *B. Sarmienti* Lorentz, *B. arborea* Engl., *Guaiacum officinale* L., *G. sanctum* L., *G. guatemalense* Planch., *G.*

Planchoni A. Gray, *G. Palmeri* Vail., and *G. Coulteri* A. Gray are described, and a check list of common names is given. Distinguishing characteristics of the woods of Zygophyllaceae in general, and of *Guaiacum* and *Bulnesia* in particular, are pointed out.—Part II discusses lignum-vitae from the commercial standpoint. True lignum-vitae is confined to the genus *Guaiacum*, although substitutes in the same family are obtained from *Bulnesia* sp. *Porlieria* is too small to market. The heartwood, 75–80 pounds per cubic foot, is very dense, hard, tough and resistant to wear, and is especially adapted for use under water. It is utilized chiefly for bushing blocks, bearings for water turbines, bowling balls, mallets, pulleys, and railroad cross ties; a resin derived from it has medicinal qualities as a diaphoretic and alterative. Present sources of supply are Cuba, Jamaica, Bahama Islands, Porto Rico, Haiti, Domican Republic, Nicaragua, and Mexico. The West Indies, Central America, Mexico, and western South America can probably furnish adequate supplies for many years. No wood on the market is recognized by the trade as a satisfactory substitute for lignum-vitae. Proposed substitutes described are: *Xanthostemon verdugianus* Naves (Philippine lignum-vitae or mancono); *Schinopsis Lorentzii* Engl. and *S. Balansae* Engl. (red lignum-vitae or quebracho); *Melanorrhoea usitata* Wall. (Indian lignum-vitae). Ten Australian woods are mentioned which have been used as substitutes. "Guayacan" is a vernacular term applied to many species of hardwoods,—*Caesalpinia melanocarpa* Griseb., *Tecoma* sp., and some 40 others. *Zollernia paraensis* Huber of Brazil has been substituted under the name "palo santo," which is also applied to species of Zygophyllaceae.—*H. H. Chapman.*

808. S[chaeffer], A. **Au parlement.** [**In Parliament.**] Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est **15**: 45–47. 1923.—An extract from a speech in the French Parliament calls attention to certain facts of importance in forest management in eastern France. France has an excess of fire-wood and lacks saw-timber. Periodically, with changes in the personnel of the Forest Service, there are movements first to convert coppice into high forest and then to revert to coppice. There should be a stable policy in favor of conversion. As a result of this speech, the Director of the Forest Service ordered that in communal forests, particularly in the reserved portions, measures be taken to convert coppice into high forest as soon as the consent of the communes can be secured.—*Joseph Kittredge, Jr.*

809. Simonsen, John Lionel. **Constituents of some Indian essential oils. Parts IX and X.** Indian Forest. Rec. **9**: 341–348. 1923.—The oleo-resins of *Pinus excelsa* and *P. gerardiana* were distilled and the constituents thus determined are described.—*E. N. Munns.*

810. Smith, Herbert A. **Forest Products Laboratory.** *31 p., 23 fig.* Gov't. Printing Office: Washington, D. C., 1922.—This report, prepared to supplement the exhibit of the U. S. Forest Service at the Brazil Centennial Exposition, describes briefly the investigations carried on at the Forest Products Laboratory at Madison, Wisconsin. [Published also in Spanish and Portuguese.]—*W. N. Sparhawk.*

811. Smith, Herbert A. **Forests and forestry in the United States.** *16 p., 5 pl.* Gov't. Printing Office: Washington, D. C., 1922.—This report, prepared as a supplement to the exhibit of the U. S. Forest Service at the Brazil Centennial Exposition, describes briefly the forests of the U. S. A., the development of the lumber industry, the forest fire menace, and the forestry movement. [Published also in Spanish and Portuguese.]—*W. N. Sparhawk.*

812. Sterrett, W. D. **A generalized yield table for even-aged, well-stocked stands of southern upland hardwoods.** Jour. Forest. **19**: 382–389. 1921.—The cubic volume of well-stocked stands varies uniformly with average height of dominants regardless of type and species. Southern mixed hardwood stands were used as a basis and cubic volume curves were prepared in which the yields followed a regular form; the same data were found to apply to the northern forests with the same species present in the stands. Yield tables thus constructed are applicable to a wider range of conditions than is usually considered possible, and data on stocking, diameter, and dominance are necessary.—*E. N. Munns.*

813. Toumey, J. W., and R. C. Hawley. **The Den.** Yale Univ. School Forest. Bull. 5. *10 p., 3 fig.* 1920.—This is a description of a 1350-acre hardwood forest in southwestern Connecticut.—*H. H. Chapman.*

814. Toumey, J. W., and Ernest J. Neethling. **Some effects of cover over coniferous seedbeds in southern New England.** Yale Univ. School Forest. Bull. 9. *39 p., 4 pl., 1 fig.* 1923.—The results are given of experiments on effect of (a) shade vs. full light and (b) mulch

vs. exposed soil on time required for germination, germination values, and survival and growth of representative conifers during the 1st season. Lesions causing death of seedlings appeared on the stem at the surface of the soil. These were caused not by damping-off parasites, but by excessive temperature of the dry surface soil of unshaded beds. With partial shade seedlings of all species were smaller. Surface temperatures, rather than soil moisture, limit survival of natural coniferous seedlings in New England.—*H. H. Chapman.*

815. Trotter, H. **Growth in trees.** Indian Forester 49: 293–301. 1923.—The author presents a summary of the American work with the dendrograph and a general abstract of MacDougal's Growth in Trees [see Bot. Absts. 10, Entry 772].—*E. N. Munns.*

816. Velte. **Eine Waldfahrt durch das Revier Charlottenhof. [An excursion through the Charlottenhof forest.]** Deutsch. Forstzeitg 38: 606–607. 1923.—The soil conditions and productivity of this 2,500-hectare pine forest have been greatly improved by under-planting (and sowing) oak and beech.—*W. N. Sparhawk.*

817. Walter. **Die Privatforstbeamten und der Antrag Müller-Franken. [Private foresters and the Müller-Frank bill.]** Deutsch. Forstzeitg. 38: 625–628. 1923.—The proposal to expropriate all forest holdings in excess of 100 hectares is opposed on the grounds that it would deprive thousands of foresters of employment and would cause serious reduction in the productivity of some 45,000 small tracts left in private hands, as few of the owners could afford to employ trained foresters.—*W. N. Sparhawk.*

818. Watson, Russell. **National needs and sustained annual yield of the nation.** Jour. Forest. 19: 390–393. 1921.—On a basis of the potential timbered area for the U. S. A. and the growth per acre per year, the possible cut from the timberlands would be equal to the present consumption. A period of 100–150 years is considered necessary to make the older regions, now devastated, productive, while the Pacific Coast could begin at once to retain its growth. On this basis there will be a lapse of 50–100 years after the present virgin stands are cut. It is calculated that this final cut will be about 1980.—*E. N. Munns.*

819. Weiss, Howard F. (Chairman, Decennial Committee.) **The Forest Products Laboratory: a decennial record, 1910-1920.** *8 + 196 p., 31 pl., 1 fig.* U. S. Forest Products Laboratory: Madison, Wisconsin, 1921.—The establishment and organization of the laboratory is outlined, its work during the 10 years is described at some length, and plans for future work are indicated. It is estimated that 10 billion board feet of wood can be saved annually through better utilization.—Part II includes the program and proceedings of the decennial celebration.—*W. N. Sparhawk.*

820. Whitford, H. N. **The use of tropical land and tropical forests.** Sci. Monthly 17: 135–145. 1923.—The tropics surpass the temperate regions in yield. Hawaii yields 5 times and Porto Rico 4 times as much per acre as Louisiana.—The Philippine experiment has advanced far enough to show that the efficiency of the native peoples must be increased before the best can be secured from the tropics.—*L. Pace.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 695, 722, 739, 749, 751, 916, 922, 953, 998, 1019)

821. Aamodt, Olaf S. **The inheritance of growth habit and resistance to stem rust in a cross between two varieties of common wheat.** Jour. Agric. Res. 24: 457–469. *2 pl.* 1923.—The author presents data regarding the mode of inheritance of growth habit and resistance to stem rust in a cross between Kanred, a resistant winter wheat, and Marquis, a susceptible spring variety. The results of such a cross show all grades between the 2 growth habits, indicating the presence of multiple factors for this character. F_3 selections, homozygous for heading period and varying all the way from pure spring character to pure winter character, were obtained, each of a different genetic nature.—The results also show that there is no correlation between growth-habit character and reaction to rust. The resistance and susceptibility of the host to several different forms of rust are inherited as a single genetic factor. In the F_3 generation some of the hybrid families were homozygous for the spring habit of the

Marquis parent and for the rust resistance of the Kanred parent, thus accomplishing the initial objective of the experiment and demonstrating that varieties of common wheat may be produced which will be resistant to a large number of the biologic forms of stem rust.—*Charlotte Elliott.*

822. Anderson, Irma. **The genetics of variegation in a fern.** Jour. Genetics 13: 1–12. *2 pl.* 1923.—Spores of the green and pale green variegated greenhouse fern, *Adiantum cuneatum*, produce green prothallia which, contrary to earlier reports, eventually develop pale stripes. All green ferns arising from these striped prothallia develop the characteristic variegation. Spores from the variegated ferns produce more pale green than green prothallia, in ratio ranging from 1–1.306 to 1–2.888. This ratio is not affected by any changes of the environment. Dark green chloroplasts are nearly twice as large and contain more starch than the pale chloroplasts. Pale patches may appear at any time in the life of the prothallium and do not arise at any period with special frequency. These green and white areas in the prothallia presumably have different genetic possibilities and are of interest inasmuch as, the prothallus being a haploid structure, a genetic segregation has taken place after the reduction division, in which the character of the spores was determined. As gametes are not obtainable from the white areas, direct genetic study of what has taken place is impossible. From the 64 spores formed in each sporangium approximately 1 green to 2 pale prothallia grow. Unless nondisjunction or some other error of cell division occurs 2 such classes containing odd numbers cannot ensue from such a process. An account of the cytology of these phenomena is promised. —*Robert T. Hance.*

823. Baur, E., und R. Goldschmidt. **Wandtafeln zur Vererbungslehre.** [**Wall charts for teaching genetics.**] Gebrüder Borntraeger: Berlin.—Twelve charts in colors illustrate experiments with snails, mice, comb in poultry, guinea pigs, Andalusian fowls, snapdragons, oats, wheat, barley, and corn.—*Orland E. White.*

824. Baur, E., E. Fischer, und F. Lenz. **Menschliche Erblichkeitslehre.** [**Human heredity.**] *442 p., 8 pl., 112 fig., 1 chart.* J. F. Lehmann: Munich. 1923.

825. Becker, Josef. **Grundlagen und Technik der gärtnerischen Pflanzenzüchtung.** [**Foundations and technique of horticultural plant breeding.**] *xvi + 400 p., 17 col. pl., 149 fig.* Paul Parey: Berlin, 1922.—This manual and reference book is written primarily for horticulturists, seedsmen, gardeners and amateurs interested in any way in horticultural plant breeding. The subject is treated in its broadest aspects under 5 general headings: plant reproduction; the creation of new varieties; genetics or inheritance; the grounds, apparatus, buildings, laboratories, greenhouses, cold frames, etc., necessary to conduct the breeding work; and plant breeding. Under plant reproduction, various types of horticultural propagation, asexual and sexual, are considered, both practically and botanically. Flower morphology, fertilization, embryology, parthenogenesis, etc., are discussed in detail. Under section 2, classification, origin of species, kinds of variation, and the views of Linnaeus, Cuvier, Agassiz, Lamarck, and Darwin on the origin of species and variations are discussed. Section 3, covering over 60 pages, is devoted to such topics as Mendel's laws, the factorial hypothesis, xenia, crossing-over and linkage. Sections 4 and 5 take up the actual process of plant breeding, how to go about it, what equipment is needed, suggestions as to breeding problems in general, etc.—*Orland E. White.*

826. Bhide, R. K. **A cause of sterility in rice flowers.** Agric. Jour. India 17: 584–586. 1922.—Examples of sterility in various strains of Indian rice are cited which the author considers may be due to malformation and incomplete development of the pollen.—*A. Howard.*

827. Blaringhem, Louis. **Sur la mosaique des sexes chez un hybride d'oseilles sauvages. (Rumex acetosa L. × R. scutatus L.)** [**On the mosaic [condition] of the sexes in a hybrid of [two] wild sorrels.**] Compt. Rend. Acad. Sci. Paris 177: 69–71. 1923. Pistillate plants of *R. acetosa* were pollinated from the polygamous *R. scutatus*. Out of more than 1000 flowers, only 19 seemed fertilized, and only 7 F_1 hybrids were obtained. These much resembled *R. acetosa*, but the fertility was greatly reduced. There were 5 pistillate plants, and 2 with both staminate and hermaphrodite flowers. The hermaphrodite flowers were found mainly on the median verticels of the branches. This the author styles a "mosaic distribution."—*John Belling.*

828. Bluhm, Agnes. [German rev. of: Goldschmidt, Richard Benedict. Ascaris. Eine Einführung in die Wissenschaft vom Leben für Jedermann. [Ascaris. An introduction to the science of life for everyone.] *296 p.* Theodore Thomas: Leipzig, 1922.] Arch. Rass.- u. Ges. Biol. 15: 47–48. 1923.

829. Bluhm, Agnes. [German rev. of: (1) Schaffner, J. H. Control of the sexual state in Arisaema triphyllum and Arisaema dracontium. Amer. Jour. Bot. 9: 72–78. 1922 [see Bot. Absts. 11, Entry 4692]. (2) Molz, E. Versuche zur Ermittelung des Einflusses äusserer Faktoren auf das Geschlechtsverhältnis des Rübennematoden (Heterodera Schachtii A. Schmidt). [Investigations to determine the influence of external factors on the sex relation of turnip nematodes.] Landw. Jahrb. 54: Heft 5. 1920.] Arch. Rass.- u. Ges. Biol. 15: 55–57. 1923. [See also Bot. Absts. 12, Entry 5609.]

830. Boshnakian, Sarkis. The relation of the spelt factor in wheat to rachis internode characters. Genetics 8: 261–275. *2 fig.* 1923.—The report deals with the effect of the spelt factor *S* on density *C* and squareheadedness *Q*, in a cross between a dense squarehead-club *Triticum compacto-capitatum* (*ssCCQ*) and a lax spelt *T. spelta* (*SSccq*). Factor *Q* represents presence of a group of factors producing squareheadedness, and *q* their total absence. Analyses carried to F_3 show that density and spelting are due each to single factor differences; when both are in a recessive condition they represent either *T. vulgare* (*ssccq*) or *T. sativum capitatum* (*ssccQ*) types. In a correlation table where one magnitude represents different degrees of density and the other of squareheadedness, it was found that all individuals carrying the *S* factor were isolated in an area where there were no non-spelts. Within the spelt group *C* and *Q* factors remaining constant, *Ss* individuals were decidedly less dense and less squareheaded than *ss* plants; and that this inhibiting characteristic was still more apparent among homozygous spelts. It is concluded that the spelt factor acts as a partial inhibitor on the full expression of the factors for density and squareheadedness.—*S. Boshnakian.*

831. Brierley, William B. On mutation of species. British Med. Jour. 2: 722–726. 1922.—This is a discussion of the mutation concept as applied particularly to the lower organisms—the protozoa, fungi, and bacteria—with a review of the literature. Mutations are placed in 2 general categories. In the strict sense a mutation is a change in the fundamental nature of 1 or more hereditary units; in the broader sense, it is a change in genotype due to abnormal distribution of hereditary units. "A change originating in normal distribution of hereditary units in crossing, or as a result of redistribution due to the appearance of any form of genetic impurity in the parent individual is not a mutation." To establish biological mutation requires the same precise proof as that required for chemical mutation and as in the latter case is dependent upon the analysis of the original and derived products. The mutation concept of the microbiologists at present cannot be equated with that held by the geneticists working on higher forms, owing to the absence of a method of factorial analysis by cross-breeding and the unavailability of detailed cytological information regarding the genetic structure and behavior of the hereditary mechanisms. In the protozoa and fungi there is the possibility of the origin of apparently new and distinct strains in the normal cytological processes, and it is suggested that apparent mutations may be due to selective isolation of such strains. For bacteria, on the present data, a similar hypothesis is suggested. That mutation may occur in micro-organisms is not denied, but so far no adequate proof of such has been produced. Discussion of this paper by members of the Section of Microbiology of the British Medical Association was followed by a reply from the author, which is printed at the end of the original paper.—*Orland E. White.*

832. Brimhall, Dean R. Family resemblances among American men of science. Amer. Nat. 56: 504–547. 1922. II. Degree of resemblance in comparison with the generality: proportion of workers in each science and distribution of replies. Amer. Nat. 57: 74–88. 1923. —This is an inquiry into the status of the near relatives of 956 leading American men of science, with a view to determining some of the resemblances or differences in the intellectual tastes and capacities of those near of kin. Over ¼ of the subjects were found to have relatives, not more remote than cousins, who are scientists, or men of distinction in fields other than science. The brother of a man of science is 72 times as likely to be distinguished as is a man selected at random. Likewise a sister seems to be about 70 times as likely to be distinguished as a woman

selected at random. There is a resemblance between relatives in the kind of activity which they select as well as in the quality of their performance. An extensive table includes the names of distinguished scientists selected by the most objective method that could be devised, and, arranged in convenient form for cross reference, are the names, exact relationship, and field of activity of their distinguished relatives. [See also Bot. Absts. 12, Entry 5603.] —*C. H. Danforth.*

833. Castle, W. E. **Further data on webbed toes.** Jour. Heredity **14**: 209–210. *1 fig.* 1923.—A family is reported in which the character occurs in females only and passes from mother to daughter. Comparison with other cases reported suggests autosomal, rather than X- or Y-chromosome inheritance. But the peculiar Hurlin family would suggest for that case Y-chromosome inheritance, as in certain fishes.—*W. E. Castle.*

834. Chasset, L. **Un curieux cas de régression.** [**A curious instance of reversion.**] Rev. Hort. **94**: 218. 1922.—The pear variety Duchesse Bererd is a seedling of D. Bronzée, which in turn is a sport of D. d'Angoulême. A branch was found on a tree of D. Bererd, bearing fruits typical of D. d'Angoulême. This new sport, therefore, is a reversion to the type of the grandparent.—*E. J. Kraus.*

835. Cockayne, Leonard. **Note concerning a spineless wild-irishman (Discaria toutatou).** New Zealand Jour. Sci. and Tech. **5**: 206–209. 1922.—Previously the writer had raised spineless wild-irishmen under special conditions of moisture. The spines became leafy shoots. He now reports the discovery of spineless shrubs showing in nature side by side with the spiny variety. He expects to study the genetics of this character.—*Robert T. Hance.*

836. Cockerell, T. D. A. **Supplementary note on Megaloprepus (Odon.: Agrionidae.)** Entomol. News **34**: 136–137. 1923.—Specimens of Megaloprepus from the head waters of the Rio Carare, Colombia, at altitudes of 2000–5000 feet, contained forms described as *caerulatus* (Drury) and *brevistigma* (Selys). These appeared as distinct species rather than varieties, as commonly supposed.—The biological relationship is unknown, but *brevistigma* does not occur north of Panama. This type of Odonata is of great antiquity and the characters are extremely valuable. Variations are not attributable to direct effect of environment and hence it must be assumed that the insects are strongly heterozygous. It is not known whether *caerulatus* and *brevistigma* cross. Probably when the Isthmus of Panama was under water *caerulatus* was the central American species and *brevistigma* that of the Andean region of South America. Hybridization probably occurred and the variation produced. But *brevistigma* having a large range has remained in part unmodified, though its territory is gradually being overrun by *caerulatus*. Eventually homozygous combinations may be sorted out, giving rise to a series of closely allied races or species. A very instructive case for comparison with that of *Megaloprepus* is that of *Steganura*, a genus of African birds, discussed by J. P. Chapin in Amer. Mus. Novitates No. 43. 1922.—*F. E. Whitehead.*

837. Coffman, F. A., and K. S. Quisenberry. **A multiflorous variation in Burt oats.** Jour. Heredity **14**: 185–192. *5 fig.* 1923.—In a study of variability in Burt oats a multiflorous plant, having in general the appearance of an F_1 individual resulting from a hulled × naked oat cross, was discovered at Akron, Colorado, in 1920. A total of 59 progeny plants, all closely resembling the original variant were grown in 1921. About 300 progeny were grown from the seed of these plants in 1922.—Among the 359 plants only 1 with only naked kernels was found, while no plants bearing only hulled kernels were produced. The 1 plant bearing only naked kernels was an undeveloped individual and resembled the other plants of the variant type more closely than it did the true *nuda* oats.—In naked oat × hulled oat crosses the F_1 plants are intermediate between the parental types while the F_2 plants gave a ratio of 1 hulled: 2 intermediate: 1 naked. The genetic behavior of this multiflorous variant is not in agreement with the results observed by those reporting on crosses of hulled × naked oats and the authors therefore believe that the occurrence of this variant form may be attributed to mutation rather than to natural crossing.—*F. A. Coffman.*

838. Collins, J. L., and Margaret C. Mann. **Interspecific hybrids in Crepis. II. A preliminary report on the results of hybridizing Crepis setosa Hall with C. capillaris (L.) Wallr. and with C. biennis L.** Genetics **8**: 212–232. *9 fig.* 1923.—In a cross of *Crepis setosa* with 4 haploid chromosomes × *C. capillaris* with 3 haploid chromosomes an F_1 was obtained which

resembled *C. setosa* and had 7 somatic chromosomes. The chromosomes do not pair in reduction divisions but pass at random to either pole. Back crosses indicate that F_1 gametes with the chromosome complex of either parent are most likely to survive. In the cross *C. setosa* (N = 4) × C. *biennis* (N = 20) the F_1 resembles *biennis* and has 24 somatic chromosomes. In reduction the *biennis* chromosomes pair with each other so that about 10 pairs and 4 singles are present. The singles lag behind in division, but pass to the poles after dividing or may pass at random to either pole without dividing. Due to irregular chromosome distribution, segregates can be obtained with various chromosome numbers.—*Karl Sax.*

839. Cotton, Henry A. **Inheritance in mental disorders.** 2nd Internat. Congress Eugenics. Vol. 1. Eugenics, genetics and the family. *170–173.* Williams and Wilkins Co.: Baltimore, 1923.—In the New Jersey State Hospital the factors in mental disorders were studied over a period of 5 years, some 50,000 individuals being charted. In many families the incidence of insanity was high but in many there was no hereditary taint; the latter are considered the more significant. In "functional" disorders certain extrinsic factors are far more important than the hereditary factors. One of the main causes and the true basis of functional psychoses frequently is cerebral toxemia caused by focal infection of teeth, tonsils, or other susceptible parts. The theory of direct inheritance of mental disorder is at present not fully supported.—*F. G. Danforth.*

840. Coulter, Merle C. **Outline of genetics, with special reference to plant material.** *vii + 211 p., 31 fig.* Univ. Chicago Press: Chicago, 1923.—This is an elementary text for botanical and biological students, with additional material intensively treated in small type for use in more advanced work. The 13 chapter headings, arranged in the order named, are: backgound of genetics, inheritance of acquired characters, Mendel's law, factor hypothesis, inheritance of quantitative characters, linkage, mutation, bud variation, the gametophyte in inheritance, sterility, the endosperm in inheritance, hybrid vigor, and sex determination. Short bibliographies of literature cited follow each chapter. A special claim is made for up-to-dateness. Under mutation, locus changes, complex mutations, deficiency, duplication of chromosomes, non-disjunction, and tetraploidy are discussed in the light of recent research. Under sterility, the various types from the standpoint of cause are classified and discussed in detail.—*Orland E. White.*

841. Crew, F. A. E. **A mutant of the Old English rat.** Jour. Heredity 14: 221–222. *1 fig.* 1923.—What appears to be a mutant form of the Old English rat was captured at Bristol, England, in 1920. These individuals were creamy white, with black eyes. Breeding experiments indicate that the character is recessive to normal coat color. Crosses were also made with the agouti (white and yellow bellied), but the new form would not cross with the fancy rat (*Mus norvegicus*).—*R. C. Cook.*

842. Danforth, Ralph E. **Creative effort as a factor in human evolution.** Sci. Monthly 17: 129–134. 1923.—The author suggests that if man organized his endeavors to improve his environment as well as the race both would be advanced in loveliness and perfection.—*L. Pace.*

843. Davenport, C. B. **Body build and its inheritance.** Proc. Nation. Acad. Sci. [U. S. A.] 9: 226–230. *5 fig.* 1923.—The theory which attempts to account for body built on the basis of nutrition is not complete. There are genetic differences among families in the process of fattening. Body build was measured by the ratio chest girth divided by stature—the relative chest girth. This is, in the male, 67 per cent at birth, 47 per cent at 13 years, rising to 52 per cent at 22 years, and probably continues to rise slightly up to 50 years. The curve of distribution of adult build shows 2 peaks, one slightly below and the other somewhat above the mean build. These 2 peaks persist in all similar curves from birth to maturity. One peak probably represents persons of medium build, the other very largely heterozygous individuals (produced by crosses of fleshy and slender strains) in whom fleshiness tends to be dominant. Body build is hereditary. This is shown by the fact that members of a family frequently show similar changes in build throughout middle life. The inheritance of build generally involves 2 or more genetic factors, though sometimes only 1. The factors for fleshiness dominate slightly over those for slender build.—*H. R. Hunt.*

844. Davenport, Chas. B. [Rev. of: **Eugenics, genetics and the family.** Vol. I of Scientific Papers of the 2nd Internat. Congress of Eugenics. *450 p.* Williams & Wilkins Co.: Baltimore, 1923.] Science 58: 143–144. 1923.

845. Davis, Robert L. **Frost resistance in flax.** U. S. Dept. Agric. Dept. Circ. 264. *8 p., 5 fig.* 1923.—Flax varieties vary in frost-resistance and marked improvement may be secured by selection. Tests on 15 flax varieties and selections indicated that those resistant to frost in most cases were also strongly wilt-disease-resistant. Plants from seed, low in germination, are very frost-susceptible. The temperature range for frost resistance tests with flax is 21–24°F. The relative resistance of flax varieties was based on percentages of plants surviving the frosts.—*Orland E. White.*

846. Ducellier, L. **L'hybridation du blé en Algerie. Formes speltoides et durelloides.** [**Hybridization of wheat in Algeria. Speltoid and durum forms.**] Bull. Soc. Hist. Nat. Afrique Nord 14: 164–172. *2 pl.* 1923.—The author reports finding wheats of spelt-like form growing in fields of common wheat. The forms differ from true spelts in having non-articulate rachis, free kernels, and spikelets usually containing 3 fertile florets. A number of these speltoid forms differing among themselves as to hairiness of chaff, awn development, and color of seed were collected near Algiers and Constantine. The progeny of any 1 of these forms segregated into only 2 groups, speltoid and common with no intermediates; the segregation resembles that of species crosses. The author concludes that the appearance of speltoid forms may be explained in certain cases by natural crossing between spelt and common wheat forms. —Another aberrant form found in a field of common wheat near Constantine consisted of a single durum-like plant with very short awns. The progeny segregated into common, intermediate, and durum forms. None of the types found in these groups resembled closely any durum or common wheat varieties usually grown in Algeria. The author states that this form is probably due to natural crossing between a durum and common wheat.—Another aberrant form, × *Triticum Rodeti* (Trabut) resembling awned spelt, is also described. This form was found in several localities and with minor variations. These forms are thought to have originated from crossing of *Aegilops ventricosa* with different varieties of durum and possibly with several different species of wheat. Some of these forms it is thought will prove of economic importance for Algeria.—*T. E. Odland.*

847. Dunn, L. C. **A lethal gene in fowls.** Amer. Nat. **57**: 345–349. *1 fig.* 1923.—A Pit Game male was crossed with White Wyandotte females giving an F_1 generation all colored (*C c*). One of these F_1 males when mated to his mother and other female relatives gave about ½ as many white offspring as would be expected on a single factor basis. The hypothesis is put forward that this male carried a lethal gene *l* which is closely linked with *c*. The occurrence of the gene *l* in homozygous condition is thought to cause the death of the chicks as embryos. From a mating of the male in question to 6 related females, 58 colored to 32 white progeny were obtained, the expected being 60 colored and 30 white.—*F. A. Hays.*

848. Dunn, L. C., H. F. Webb, and M. Schneider. **The inheritance of spotting in Holstein cattle.** Jour. Heredity **14**: 229–240. *7 fig.* 1923.—Over 1 million pure bred Holstein cattle are registered in the herd books of the Holstein-Fresian Association. Heretofore this wealth of interesting material has not been utilized, and the present paper is chiefly of value in pointing out its nature and value, and indicating methods of attacking the problem. The spotting grades of the following animals were used: 3 bulls (with light, medium, and dark spotting); a random sample of about 50 cows mated with each of these bulls; and 1 or more offspring from each of these matings,—294 animals in all. Differences in amount of spotting appear to be inherited, and the darker grades of spotting are probably partially dominant over the lighter. Segregation of factors determining the grosser grades of spotting occurs, but some degree of blending also takes place, possibly due to numerous modifying factors. Because of the extreme rarity of identical twinning in cattle it appears to be impossible to measure the non-genetic variation by comparing the spotting variation of monosexual twins.—*R. C. Cook.*

849. Essenberg, J. M. **Sex-differentiation in the viviparous teleost Xiphophorus helleri Haeckel.** Biol. Bull. **45**: 46–96. *10 pl.* 1923.—A description of sexual development in this fish is given from birth to sexual maturity based on macroscopic observations of secondary sexual characters and on histological examination of the gonads of 300–400 specimens. At birth the paired gonads are indifferent but almost immediately thereafter the indifferent gonads of the females become ovarian and fuse, while in the male the gonads undergo marked changes and become testes. The male gonads remain definitely testicular thereafter while in all the

females the primordial germ cells disintegrate and retrogression occurs at the 12.5–26 mm. stage. In about ½ of the females retrogression is followed by the development of male gonads, germ cells and secondary sexual characters. As evidence of the transformation of part of the females into males is cited a reversal in the sex ratio during the growth period since among immature fish about 75 per cent are females while in mature fish about 75 per cent are males. This is in spite of a higher mortality rate among the males and is due, the author believes, to sex-inversion or transformation. Cases of sex-inversion in other vertebrates are reviewed.—*L. C. Dunn.*

850. Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. Bd. 4. Die Züchtung der vier Hauptgetreidearten und der Zuckerrübe. [Handbook of agricultural plant breeding. Vol. IV. The breeding of sugar cane and the four most important cereals.]** *4th rev. ed., vi + 483 p., 43 fig.* Paul Parey: Berlin, 1923.—This 4th edition, following closely the general plan of the 1st issued in 1907, contains about 100 additional pages and additional figures. Both Erich von Tschermak and Theodor Roemer have contributed freely to the different chapters. General discussions cover over 100 pages and these include chapters on variability, correlations, methods of breeding, technique of hybridization, and a general exposition of hybridization and laws of inheritance in cereals. For each of the 4 cereals,—wheat, rye, barley, and oats,—a similar program is followed. The morphology and physiology of the flower is discussed, followed by chapters on variability and correlations, methods of breeding, selection of spontaneous variations, and hybridization. With sugar beets the major portion is devoted to methods of breeding. Literature throughout the book is copiously cited, particularly of European authors. A list is given of the most important works and journals used in the citations.—*L. R. Waldron.*

851. Fruwirth, C. **Zur Hanfzüchtung. [Hemp breeding.]** Zeitschr. Pflanzenzucht 8: 340–401. 1922.—Results of hemp breeding experiments carried on since 1902 are reported. Observations were made on the effect of continuous selection for a given character (seed color) and on the behavior of this character in crosses. By continuous selection light seeded and dark seeded races were established. Crossing of the 2 types resulted in an intermediate type in the F_1. Segregation in F_2 was approximately 1:2:1. Within each color group there were minor variations in intensity of color, due apparently to modifying factors.—A study of the effects of long continued inbreeding on vigor and yield was also undertaken. Continuous inbreeding resulted in a decrease in yield of seed and in total weight of the inbred plants. There was, however, no perceptible decrease in height of plants or length of life. F_1 hybrids of 2 inbred lines showed an increase in plant weight and yield of seed over the higher yielding parent, due to heterosis.—*A. J. Mangelsdorf.*

852. Gates, R. R. **Heredity and eugenics.** *xiii + 288 p., 35 fig.* MacMillan Co.: New York, 1923.—This detailed summary of present knowledge of human heredity, written from the standpoint of a geneticist and biologist, is intelligible to the layman as well as to the scientist and specialist. The subject is discussed under 6 general headings, following which is a list of general works on eugenics and a bibliography of over 400 papers cited in the text. The 6 general headings are: (1) introduction and definition of heredity; (2) general aspects of heredity—inheritance of differences, Mendelism; (3) inheritance of physical characters in man—stature, eye color, skin color and hair characters, albinism, left-handedness, digital abnormalities, and various other abnormalities; (4) inheritance of mental characters—feeblemindedness, insanity, cacogenic families, musical ability, handwriting; (5) limits of heredity—kinds of twins, finger prints, lethal factors, inheritance of twinning; (6) social and world aspects of eugenics—the basis of racial and temperamental differences—the results of crossing between races, the problems of populations, population and quality.—*Orland E. White.*

853. Groszmann, M. P. E. **Some limitations of present theories.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *351–357.* Williams and Wilkins Co.: Baltimore, 1923.—The present tendency is, unfortunately, to stress the importance of heredity and to undervalue the effects of environment. For instance, prenatal influences are probably more effective in producing variations than Weismannists believe. The germs and toxins of disease may pass from mother to fetus. Human defects, claimed to be hereditary, may often be corrected, and the individual becomes normal. The value of mental tests has been over-

stressed. These tests do not reach the deeper processes of the mind, the subconscious mind, etc. Attempts to evaluate the inherent quality of various social strata by the use of mental tests ignore the consequences of opportunity. Genetics is a promising, but young, science; so its conclusions should be carefully scrutinized.—*H. R. Hunt.*

854. Hadlington, James. **Poultry notes. August.** Agric. Gaz. New South Wales **34**: 596–600. 1923.—Average number of eggs per hen from White Leghorns is given for 20 successive years from the Hawkesbury Agricultural College egg-laying tests. It is probable that very high egg production is rather the result of isolation by trap-nesting than the result of breeding. Increase of egg production in White Leghorns has not been of much moment. It is possible to reduce flock average production while attempting to breed for individual high production.—*L. R. Waldron.*

855. Holmes, S. J. [Rev. of: **Eugenics in race and state.** Vol. II. of the Scientific Papers of the 2nd Internat. Congress of Eugenics. *472 p.* Williams & Wilkins Co.: Baltimore, 1923.] Science **58**: 144–145. 1923.

856. Ireland, Alleyne. **The nature-nurture issue in its bearing on government.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *419–426.* Williams and Wilkins Co.: Baltimore, 1923.—The failure of government to progress is due to lack of appreciation of truth in political relations. Though all persons have the right to receive the services of government, all are not equally capable of performing these services, or of selecting those capable of performing them. Popular constitutions were framed to preserve individual rights, and not to create governments to perform public services. By limiting the power of government to do evil, its capacity to render public services is restricted. Governments do not attempt a scientific study of methods by which popular ideals may be realized. Since popular government is moulded by the characteristics of people, it is important to determine whether these characteristics are the products of heredity or of environment. This knowledge is needed immediately, because government is coming to pervade more and more the daily lives of all.—*H. R. Hunt.*

857. Jordan, David Starr. [Rev. of: Goldsmith, William M. **The laws of life: principles of evolution, heredity and eugenics.** *441 p.* Richard G. Badger: Boston, 1923 (see Bot. Absts. 13, Entry 175).] Science **58**: 207. 1923.

858. Jørgensen, K. A. **Olsgaard og Lyngby Kaalroestammer. [Olsgaard and Lyngby varieties of rutabaga turnips.]** Tidskr. Froeavl **10**: 402–407. 1922.—An account is given of the breeding of these Danish varieties.—*Ernst Gram.*

859. Kajanus, Birger. **Über Ährchenabstand und Ährchenzahl bei einigen Weizenkreuzungen. [On internode-length of spikes and number of spikelets in some wheat crosses.]** Hereditas **4**: 290–340. 1923.—The author deals with the relation of rachis-internode length to number of spikelets, and the further relation of these to specific types of *T. vulgare*, *T. spelta*, *T. durum*, *T. turgidum*, and *T. dicoccum;* the study comprises upward of 15,000 plants derived from 6 specific crosses. In *T. vulgare* × *T. spelta*, the internode of the spelta segregates averaged as a rule over 2 mm. longer than the *T. vulgare* of the same generation; the F_2 results being 5.82, 5.27, and 3.68 mm., respectively, for *T.* vulgare (*ss*), heterozygous (*Ss*), and spelt (*SS*) types. Regarding number of spikelets, *spelta* segregates had about 2 spikelets less than *vulgare* of the same generation, their relation being 19.78, 21.39, and 22.04 spikelets for *SS*, *Ss*, and *ss* types respectively. In reciprocal crosses between *T. spelta* (*SScc*) and *T. compactum* (*ssCC*) the effect of *S* factor as mentioned above held true, but the introduction of short internode factor *C* tended to further increase the number of spikelets. In *T. vulgare* × *T. turgidum* crosses, where spelta and durum types also segregated out, the specific types ranked as follows with respect to their effect on shortening internode-length and increase in number of spikelets: *turgidum*, *durum*, *vulgare*, and *spelta*. The results of *T. vulgare* × *T. dicoccum* were similar to the above; the *dicoccum* segregates having as a rule shorter internodes and greater number of spikelets, and *spelta* segregates longer internodes and fewer spikelets, with *vulgare* types holding intermediate positions. The author incidentally refers to and describes the new forms *compacto-spelta*, *lanceolatum*, and *compressum* which appeared in species-cross segregates.—*S. Boshnakian.*

860. Kempton, J. H. **Inheritance of mesocotyl length in hybrids of brachytic maize.** Amer. Nat. 57: 374–377. *1 fig.* 1923.—Studies of hybrids between brachytic and Hopi revealed no tendency toward a shortening of the mesocotyl of brachytic plants, corresponding to the reduction in length of the internodes. The failure of the mesocotyl to behave in inheritance similarly to the internodes suggests the possibility that this organ is in reality an elongated node as held by Van Tieghem and supported by the fact that roots may arise at any point on its surface.—*H. M. Steece.*

861. Kempton, J. H. **The story of the maize plant.** [Rev. of: Weatherwax, Paul. **The story of the maize plant.** *247 p.* Univ. Chicago Press: Chicago, 1923 (See Bot. Absts. 12, Entry 4990).] Jour. Heredity 14: 274–276. 1923.—Attention is called to the scant treatment genetics receives in the book. Omission of many references is noted in the bibliography, and many misstatements and unfounded generalizations are pointed out. [See also Bot. Absts. 13, Entry 682.]—*R. C. Cook.*

862. King, Helen D. **Is inbreeding injurious?** 2nd Internat. Congress Eugenics. Vol. 1. Eugenics, genetics and the family. *270–277.* Williams and Wilkins Co.: Baltimore, 1923.—Inbreeding albino rats for 40 generations accompanied by rigid selection, brought to light abnormalities and weaknesses in the early generations. Following this the inbred animals were equal or superior to stock rats in the following respects. (1) Body weight: males inbred 7–15 generations were 12 per cent heavier than stock rats; males inbred 36–38 generations were 20 per cent heavier than stock. (2) Fertility: females inbred 1–25 generations bore average litters of 7.39 young as compared with 6.75 for stock. (3) Longevity: inbred rats compared favorably with controls. (4) Brain weight: animals in early generations of inbreeding showed deficient brain weight. Rats of 38th generation had brain weight as high or higher than controls. The author concludes that inbreeding with selection is a powerful agent in purifying stock, eliminating defects and concentrating good heredity.—*P. C. Mangelsdorf.*

863. Koehler. [German rev. of: Krieg, H. **Die Prinzipien der Streifenzeichnung bei den Säugetieren, abgeleitet aus Untersuchungen an den Einhufern.** (The principles of stripe-markings in mammals as deduced from investigations on the horse family.) *101 p., 58 fig.* Julius Springer: Berlin, 1922.] Arch. Rass.- u. Ges. Biol. 15: 58–61. 1923.

864. Lapouge, G. V. de. **La race chez les populations mélangées.** [The race in mixed populations.] 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *1–6.* Williams, and Wilkins Co.: Baltimore, 1923.—The races of man are much mixed, and can not be separated from one another along the lines of language, religion, or customs. Some, ignorant of biology, are led to conclude from this extensive intermixture, that there are no human races, that the race idea is merely a prejudice. This is erroneous. To believe this would mean the undervaluation of researches in racial anthropology, racial psychology, and anthroposociology. To deny the existence of human races because human stocks are mixed is considered as absurd as to deny for the same reason the reality of wild or domestic races of animals. For example, the cattle of Indo-China were produced by a combination of 3 species. Superficial observers fail to perceive more races because they think of a race as being nearly uniform, like a race produced by systematic selection. The individuals within a race of men fluctuate, yet all retain to a certain degree the characteristics of their type.—The proportions of the races in a population vary continually. These changes are due to the play of social selection—not to immigration and conquest. Social selection tends to replace eugenically superior races with inferior ones, because the former, whose economic needs are great, can not raise numerous children. On the other hand, the children of the inferior races require only a few years of parental support, hence are numerous.—The war has dealt what may be a mortal blow to the superior elements. At least $\frac{2}{3}$ of the best of France's young men have perished or become invalids. The writer believes that the diastrous racial consequences for France exist among all European peoples. A crisis is being witnessed of the superior races, menaced with extinction at a time when superior men are needed. Great problems in industry, sociology, business, and science confront man today. Science is at the boundary of the infinite, and the most vigorous intellects fail before the tasks they perceive. Man must now choose whether he will become a demi-god, or return to primitive barbarism. The widespread movement among the lower classes and races against the superior ones is considered a movement against civilization itself.—*H. R. Hunt.*

865. Lenz. [German rev. of: Sommer, R. **Familienforschung und Vererbungslehre.** (Family investigation and inheritance.) *2nd ed., 358 p.* J. A. Barth: Leipzig, 1922.] Arch. Rass.- u. Ges. Biol. 15: 77–80. 1923.

866. Lotsy, J. P. [Dutch rev. of: Cramer, P. J. S. **Coffees of the Dutch East Indies.** Tea and Coffee Trade Jour. 35: 318–322, 417–420. 1918; 36: 23–27, 119–122. 1919.] Genetica 5: 215–221. 1923.

867. Lotsy, J. P., and K. Kuiper. **A preliminary statement of the results of Mr. Houwink's experiments concerning the origin of some domestic animals.** Genetica 5: 1–50. *2 col. pl.* 1923.—Darwin held that domestic poultry is all derived from the single form *Gallus bankiva*. The authors show that Darwin was mistaken in believing that *G. bankiva* is the only wild species of fowl which produces fertile offspring when crossed with the domestic fowl. The hybrids of at least 3 species of wild fowl are fertile but unless the most favorable environmental conditions are provided sterility is likely to result. A review of historical data indicates that India is the origin of the domestic fowl but offers no clue as to which of the Indian native species may have been its ancestor. A detailed description of the 4 species, *Gallus gallus* (*Bankiva*), *G. lafayetti*, *G. sonnerati*, and *G. varius* is given together with a discussion of their habits. Hybrids from the cross *G. varius* and the domestic fowl are known in Java as "bekisars." In general coloration, crow, and power of flight these hybrids more nearly resemble the wild parents and excel both parents in size.—*D. C. Warren.*

868. Macoun, W. T. **Recent developments in the breeding of horticultural plants.** Sci. Agric. 3: 338–341. 1923.—This is a brief review of the subject with particular reference to fruit trees. The pollination studies on plums by Dorsey and on apples by Beaumont are discussed, as well as the application of Mendel's law to tree fruits, the question of bud heredity, and comparative varietal yields in apples.—*T. G. Major.*

869. Marshall, F. H. A. **The physiology of reproduction.** *2nd ed., rev., xvi + 770 p., 189 fig.* Longmans, Green & Co.: London and New York, 1922.—A detailed treatment is presented of the reproductive phases of animal life, brought up to date in this edition. The subject matter is classified under the heads of: breeding season, oestrous cycle in mammalia (covering all the main groups), changes that occur in the non-pregnant uterus during the oestrus cycle (man, monkeys, lemurs, insectivores, carnivores, marsupials, etc.), changes in the ovary (oögenesis, follicle growth, ovulation), spermatogenesis and insemination, fertilization (including parthenogenesis), accessory reproductive organs of the male and the mechanisms concerned in insemination, the biochemistry of the sexual organs, the testicle and ovary as organs of internal secretion, foetal nutrition, changes in the maternal organism during pregnancy, innervation of the female generative organs—uterine contraction—parturition—the puerperal state—lactation, fertility (including effect of age, effects of environment and nutrition), influence of the male parent, effect of drugs, effects of inbreeding and cross-breeding, inheritance of fertility, certain causes of sterility, increase of fertility—a problem of practical breeding, birth-rate in man, factors which determine sex (including a discussion of hermaphroditism), phases in the life of the individual—the duration of life and the cause of death. Separate author and subject indexes are appended.—*Orland E. White.*

870. Metz, Charles W., and Mildred S. Moses. **Chromosomes of Drosophila—chromosome relationships and genetic behavior in the genus Drosophila: I. A comparison of the chromosomes of different species of Drosophila.** Jour. Heredity 14: 195–204. *6 fig.* 1923.—A description is given of chromosome groups of 33 species of Drosophilinae (mostly *Drosophila*), being a résumé of previous papers with certain corrections and some new data. Chromosome groups fall into 13 types, which are compared from the evolutionary standpoint in order to illustrate the aim of genetical studies now under way.—*Charles W. Metz.*

871. Morgan, T. H., A. H. Sturtevant, H. J. Muller and C. B. Bridges. **Laboratory directions for an elementary course in genetics.** *16 p.* Henry Holt and Co.: New York, 1923. —The booklet contains a brief introduction, 10 laboratory exercises, and an appendix. References for supplementary reading are made to The Mechanism of Mendelian Heredity by the same authors, 1922 edition. Technical directions for breeding *Drosophila* and for morphological and simple cytological study are given; also suggestions for statistical work. Exercises with *Drosophila* illustrate simple Mendelism, complete linkage, crossing-over, sex-linkage, multiple allelomorphs, and true atavism or reversed mutation.—*P. W. Whiting.*

872. Nowinski, M., i Ks. A. Lesniewski. **Przyczynek do zmienności kwiatostanu tymotki (Phleum pratense L.)** [A study of variability in the inflorescences of Phleum pratense.] Bull. Soc. Polonaise Nat. **47**: 483–493. *4 fig.* 1922.—A statistical study of a bracteated variation of timothy is reported. This form is characterized by a bract at the base of the panicle, from which at times a leaf may grow; it was described by A. Braun as *P. pratense lusius bracteatum*, and was known to Godron, Penzig, etc. Material from 3 sources gave 8.5–15.0 per cent *bracteatum* type. Albinism was apparently associated with the *bracteatum* condition, as varying percentages of the seedlings were albinos, while the normal type gave only normal green seedlings. In field plantings from *bracteatum* panicles, the percentage of *bracteatum* individuals varied from 2.4 to 11.8 per cent. Appended is a summary in German.—*Orland E. White.*

873. Park, J. B. **Selection in broom corn.** Jour. Heredity **14**: 213–219. *3 fig.* 1923.—Results are reported of 5 years' selection in broom corn for elimination of central stem,—an extension of the rachis which is very objectionable in broom manufacture and always present to some extent in the commercial crop. One hundred and five headrow populations grown in 1918 from "stemless" mother plants gave no progenies that were free from central stem, but the percentage of heads containing it varied from 6 to 40 in the different populations. Continued selection of stemless plants for 5 years in a few of the better strains has failed to make any noticeable change in the percentage of heads producing central stem. The strains behave as though they are approximately pure lines, all producing some heads with central stem each year. Although continued selection seemed to be ineffective there was no doubt of the effectiveness of the 1st head selection. The better strains have produced decidedly less central stem than the commercial varieties and also have longer brush. Seasonal conditions have an important influence on the amount of central stem produced, the percentages for all strains rising and falling together with great regularity. Approximately pure-line methods are indicated to be the correct procedure in broom corn breeding.—*J. B. Park.*

874. Pearl, R., and S. L. Parker. **Experimental studies on the duration of life. III. The effect of successive etherizations on the duration of life of Drosophila.** Amer. Nat. **56**: 273–280. *2 fig.* 1922.—Since for much of the experimental work on *Drosophila* it is necessary to etherize the flies, it was thought important to test the effect of etherizing at different ages. Groups (about 500 flies in each) at the following ages were etherized: 1 hour; 12 hours; 36 hours; 3½ days; 7 and 14 days; 7, 14, and 21 days; 7, 14, 21 and 28 days. Unetherized control groups were kept. Etherizing appeared to have little if any effect on duration of life—all etherized flies together living 51.60 ± 0.16 days and all controls 49.78 ± 0.25 days.—*Sylvia L. Parker.*

875. Pearl, R., S. L. Parker, and B. M. Gonzales. **Experimental studies on the duration of life.** Amer. Nat. **57**: 153–192. *16 fig.* 1923.—This paper gives the detailed results of the various types of matings made, the progeny obtained from each, their survivorship distributions, biometric constants, etc. The Wild Type parent stock gave a mean duration of life of 44 days and the Quintuple stock 14 days. The F_1 flies lived 51 days, showing the characteristic increased vigor of hybrids. In the F_2's from F_1's mated inter se there were long lived stocks (with normal wings), and short lived stocks (with vestigial wings) with mean durations of life practically identical with those of the original parent stocks. In the progeny from back crosses of F_1's on parent stocks, and of F_2's on F_1's, however, there was a steady decrease in duration of life. Data are also given of wild type flies whose wings were surgically removed immediately after emergence to determine whether the low duration of life of vestigial flies might be attributed to the mechanical effect of absence of wings. The clipped flies, however, lived very nearly as long as the normal controls, the difference between the means being only about ¼ of the difference between Wild and Quintuple means.—*Sylvia L. Parker.*

876. Prell, Heinrich. **Die Biotypenbildung durch Anlagenumordnung und der Begriff der Mutation.** [The development of biotypes through rearrangement of the factors and the conception of mutation.] Arch. Entwicklungsmech. **51**: 1–23. 1922.—A general discussion is presented of abnormal chromosome segregations, aggregations, and fragmentations in relation to hereditary characters, and the relation of these processes to de Vriesian mutation.—*John H. Schaffner.*

877. Punnett, R. C. **Heredity in poultry.** *xi + 204 p., 12 pl., 28 fig.* MacMillan and Co., Ltd.: London, 1923.—This volume summarizes in rather condensed form the fundamental principles and theories governing the inheritance of many characters in domestic poultry. Consideration is given to the following topics: reversion; multiple factors; sex-linked inheritance; secondary sex characters; structural character of comb, feet, and feathers; plumage color; down color; egg characters; broodiness; and linkage. A rather extensive reference list is included and illustrations and tabulations add much to the value of the book to students and poultrymen.—*F. A. Hays.*

878. Punnett, R. C. **Linkage in the sweet pea (Lathyrus odoratus.)** Jour. Genetics 13: 101–124. *6 fig., 1 col. pl.* 1923.—Linkage data from 19 years' experiments, involving 17 pairs of factors, are discussed and analyzed from the standpoint of whether the number of characters, or groups of characters, showing independent inheritance are greater, equal to, or less than the haploid number (7) of chromosomes. Although all the necessary data have not yet been accumulated, the author believes from the evidence so far obtained and from the results obtained on *Drosophila* by Morgan and his colleagues that "the number of linkage groups in *Lathyrus* will eventually be found to correspond to the haploid number of chromosomes." —Ten of the 17 factor pairs mentioned above have been described in previous publications. Detailed descriptions of the other 7 are given. The factor pairs discussed are: purple and red flower color, long and round pollen, erect and hooded standards (flower parts), dark and light axils, fertile and sterile anthers, normal and cretin flowers, tall and Cupid (dwarf) habit, color and R-white (flowers), procumbent and bush habit, color and C-white (flowers), hairy and glabrous, tendrilled and acacia leaves, bright and dull flower color, self and marbled flower color, purple and red-purple flower color, clamped and open keel (flowers), purple and maroon flower color. In each case the dominant characteristic precedes. Definite evidence is presented for 5 linkage groups. Group 1 consists of 3 factor pairs—purple and red flower color, long and round pollen, and erect and hooded standard. Group 2 also consists of 3 factor pairs—dark and light axils, fertile and sterile anthers, normal and cretin flowers. Group 3 is made up of 2 pairs—bright and dull flowers, tendrilled and acacia leaves. Group 4 consists of 3 pairs. These pairs are procumbent and bush, color and R-White, self colored and marbled—the 2 latter occupying the same locus. Group 5 has 2 pairs, viz., color and C-white, purple and red-purple flower color. The factor pairs, tall and cupid, hairy and glabrous, clamped and open keel, from the data so far obtained appear to be independent of each other and of the 5 linkage groups, thus in all making 8 independently inherited groups, but there is a strong possibility of a very low grade of linkage for any one of these 3 factor pairs (in the neighborhood of 50 per cent), in which case the number of groups now apparently independent would be reduced to 7 and agree with the haploid number of chromosomes. Tables of detailed data are included and tentative chromosome maps are figured for the 5 linkage groups. The results were calculated from F_2 generations. In most cases, the crosses were made reciprocally.—*Orland E. White.*

879. Radosavljevich, Paul R. **Eugenic problems of the Slavic race.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *154–165.* Williams & Wilkins Co.: Baltimore, 1923.—Data on and discussion of the eugenic contributions, problems and characteristics of the Slav peoples are presented. Under historical facts, the author cites civic contributions, both ancient and modern. Under vital statistics, the fertility and high birthrate are discussed. Data are also presented on the Slav make-up as to insanity, moral crimes, felonies, suicides, thefts, general psychology, materialistic or worldly ambition, and morbid analysis.—*Orland E. White.*

880. Redfield, C. L. **Producing disease resistant plants.** Amer. Bot. 29: 94–100. 1923.—The writer argues that "the selection theory in the production of disease resistance is an illusion," that the development of disease resistance in plants is cumulative and can only be increased by the plant growing in the presence of the disease. Pure lines grown year after year under uniform conditions of infection show no increased resistance while pure lines grown year after year under gradually increasing infection show increased resistance to disease. The fact that some plants survive and others die when grown on disease-infected soil is not due to greater resistance in the plants which survive but to the fact that the infecting organism is either not uniformly distributed or that the plants which die are passing through a resting period as far as

development of increased resistance is concerned.—He states that disease resistance is heritable but whether or not he believes that the acquired resistance is inherited is not clear.—*Charlotte Elliott.*

881. Rensch, Barnhard. **Über die Ursachen von Riesen- und Zwergwuchs beim Haushuhn.** [On the causes of gigantism and dwarfness in poultry.] Zeitschr. Indukt. Abstamm.- u. Vererb. 31: 268–286. *3 fig.* 1923.—A study was made of the tissue of the domestic fowl in 3 stages: (1) germplasm of fresh eggs, (2) embryo in the 10-day stage, (3) tissue from adult birds. Cross-sections of kidney and liver tissue showed the cells to be large in the heavy breeds and small in the light breeds. The larger bones of the heavy breeds were found to contain more cells than the bones of the dwarf breeds. No difference was found in the size of nerve cells in adult tissue for large and small varieties of birds. In the 10-day stage the cells were larger from the heavy varieties, except ganglion cells, which were in inverse proportion to the size of bird. No distinctions were discovered in the tissue of undeveloped embryos in the different varieties. The chromosomes were found to be longer in the heavy varieties. The number of chromosomes is reported as the same in all breeds studied, namely, 12.—*F. A. Hays.*

882. Riley, L. A. M. **Meristic floral variation in Galieae.** Jour. Botany 60: 230–232. 1922.—Examination of 1,000 flowers of each of 3 species of *Asperula* and 7 species of *Galium* show a meristic variation ranging from 2 to 6, the greater proportion being 4-merous. Attention is called to the fact that the purpose of systematic botany is not to provide a convenient method by which botanists may name plants but to study and correlate the characters of different groups even though certain characters may be practically worthless for the purposes of determination.—*Robert T. Hance.*

883. Robertson, W. A. N. **Registration of stallions. Second annual report under the horse breeding act 1919.** Jour. Dept. Agric. Victoria 20: 280–283. 1922.

884. Rosenthaler, L., und K. Seiler. **Variationsstatistik als Hilfswissenschaft der Biochemie der Pflanzen.** [Variation statistics as a scientific aid in the biochemistry of plants.] Biochem. Zeitschr. 134: 225–233. 1922.—The variation which occurs in the chemical content of seeds of varying weights and leaves of varying ages is illustrated statistically. The results obtained justify the application of statistics in determining the chemical content of variable plant materials.—*Richard Wellington.*

885. Santos, Jose K. **Differentiation among chromosomes in Elodea.** Bot. Gaz. 75: 42–59. *Pl. 3.* 1923.—About 48 chromosomes appear in vegetative mitoses in staminate plants of *Elodea gigantea.* Two of these are much larger, and 1 is much smaller, than any of the others.—In the heterotypic division in the pollen mother cell there are 24 pairs; 1 pair is composed of the 2 large chromosomes, and 1 pair of the small chromosome and a chromosome of about average size. In this division the latter (unequal) pair separates so that the smaller chromosome of the pair passes to 1 daughter nucleus and the larger chromosome of the pair passes to the other daughter nucleus. In the "homotypic" [homoeotypic] mitosis, presumably a half of each chromosome passes to each daughter nucleus, so that 2 types of microspore nuclei are formed, containing respectively the smaller and the larger chromosome of the unequal pair.—Nothing is known regarding the chromosomes of the pistillate plant, but since *Elodea* is considered to be strictly dioecious, the author "has not the least doubt that the unequal pair of chromosomes bears sex characters."—*C. E. Allen.*

886. Sax, Karl, and H. C. McPhee. **Color factors in bean hybrids.** Jour. Heredity 14: 205–208. *2 fig.* 1923.—Crosses of 2 varieties of eyed beans and of eyed beans with white are reported. The 2 eyed varieties used were known under the local names of Old Fashioned Yellow Eye and Improved Yellow Eye. The F_1 of this cross bore "piebald" beans, not resembling either parent, and having about twice as much pigmented area as the darkest parent. In F_2 segregation occurred in the ratio of 1 O. F. Y. E.: 2 "Piebald": 1 I. Y. E. In crosses of I. Y. E. by white the 1st generation was dark mottled and a ratio of 27 mottled : 9 solid colored: 12 eyed : 16 white was obtained in F_2.—*R. C. Cook.*

887. Schaffner, J. H. **Observations on the sexual state of various plants.** Ohio Jour. Sci. 23: 149–159. *1 fig.* 1923.—Sex reversal was observed in *Acnida tamariscina, Thalictrum dasycarpum, T. dioicum, Acer saccharinum, A. rubrum,* and *Aesculus glabra.* In the dioe-

cious *Acnida tamariscina* few instances of intermediate sexual states were found. Great variation was found in *Thalictrum dasycarpum* and frequent reversals were observed in the dioecious *Acer saccharinum*. Less sex reversal occurred in *Acer rubrum*. The sexual state in *Thalictrum dioicum* was found strongly fixed, intermediates being rare. However, sex reversal was produced in both directions. The monoecious *Aesculus glabra* showed a range in sexual state from pure staminate to decidedly carpellate.—*H. D. Hooker, Jr.*

888. Scheidt. [German rev. of: Haecker, V., und Th. Ziehen. **Zur Vererbung und Entwicklung der musikalischen Begabung.** (Inheritance and development of musical talent.) Leipzig, 1922.] Arch. Rass.- u. Ges. Biol. **15**: 83–84. 1923.

889. Shull, A. F. **Ten years of heredity.** Trans. Amer. Microsc. Soc. **41**: 82–100. *8 fig.* 1922.—This account is designed to present to those without biological training the most important development of work in heredity since 1910. Chromosomes as bearers of hereditary factors, linkage and crossing-over in *Drosophila*, and the linear order of factors are explained. Interference of crossing-over is more marked when 2 regions under observation are near one another and less marked when farther apart. Certain strains of *Drosophila* have crossing-over ratios different from others. Progress made, in the period under observation is considered proportionately greater than has been made in the same period in either physics or chemistry.—*Caroline M. Perkins.*

890. Shull, Charles A. **Multiple seeded burs of Xanthium.** Science **58**: 145–146. 1923. —Seed taken from an Indiana specimen with multiple seeded burs of *Xanthium* have been grown. The attempt is being made to determine whether this is a case of reversion and to investigate a possible connection with hybridization. The writer wishes a report from anyone who finds such a bur in the U. S. A.—*C. J. Lyon.*

891. Sirks, M. J. **Handboek der algemeene erfelijkheidsleer.** [General textbook of genetics.] *x + 494 p., 5 col. pl., 127 fig.* Martinus Nijhoff:'s-Gravenhage, 1922.—Problems and phases of genetics are treated in detail under the following general headings: introduction, scope and methods, the statistical method with results and demonstrations of its use, pre-Mendelian theories of heredity, the beginnings and history of the experimental method in the study of genetics, the results of Mendel's experiments, factor interaction, inheritance of quantitative characters, complementary factors, distinct factors with the same expression, grouping of factors (linkage, crossing-over, independent assortment), the likeness or similarity of the F_1 individuals, the likeness of reciprocal crosses and the influence of sex on them, the nature and localization of the factors, the time of factor segregation (chimaeras, graft-hybrids, bud variation or bud sports), constant or true-breeding hybrids, sex-determining factors, changes in the hereditary composition of the individual, changes in the hereditary composition of pure lines and populations, the domain of genetics and its application. A bibliography of several hundred titles is appended.—*Orland E. White.*

892. Skerrett, R. G. **Immunizing cabbage by natural selection. How nature's standard biological process is adopted and speeded up by man.** Sci. Amer. **129**: 97. *Illus.* 1923. —This is a popular article describing briefly the methods used by L. R. Jones and associates at the University of Wisconsin in developing strains of cabbage resistant to "yellows," a disease caused by *Fusarium conglutinans.—Charlotte Elliott.*

893. Spinden, Herbert J. **Formal inbreeding in human society with South American examples.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *285–296.* Williams & Wilkins Co.: Baltimore, 1923.—Close marriage has been and is still the rule among many South and Central American tribes. Uncle-niece, aunt-nephew, and cross cousin marriages are a natural result of the clan system. Brother-and-sister matings have been reported and might have been considered necessary where there were no other persons of equal rank for each to marry. The eugenic significance of human inbreeding warrants a careful study of the results of this practice in South America.—*P. C. Mangelsdorf.*

894. Stanton, Hazel M. **An experimental investigation of musical inheritance.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *239–242.* Williams & Wilkins Co.: Baltimore, 1923.—Four measures of musical talent, sense of pitch, sense of intensity, sense of time, and tonal memory were given to 85 members comprising 6 families in each of which 1 member was conspicuously talented in music. The technique of

these tests is described. The tests were supplemented by case histories with regard to musical environment and experiences. It was found that individuals ranking high in the quantitative tests were also high in the qualitative rating of musical experiences. Results of the types of matings superior by superior, superior by average, and superior by poor are enumerated. In general, the offspring of musical parents are musical; those of non-musical parents are non-musical.—*Margaret Schneider.*

895. Steglich und H. Pieper. Vererbungs- und Züchtungsversuche mit Roggen. [Inheritance and breeding experiments with rye.] Fühling's Landw. Zeitg. 71: 201–221. *2 fig.* 1922.—Four rye types of 1 variety after strict sister-to-sister breeding for 25 years showed decrease of grains per head of over 50 per cent; decrease in head length of 2 cm. also resulted. In 1 case complete sterility resulted in 14 years. In 1 strain fertility remained constant, after the 1st year's decrease, for 15 years, when fertility again fell off. In 2 strains a constancy of fertility of 10 years was maintained. Different strains reacted differently toward inbreeding. —After 9 years' inbreeding, crosses were made between 3 inbred forms and the stem variety. Offspring plants showed the normal fertility of the variety. Culm and spike lengths were also increased. Inbred strains intercrossed showed an increased fertility of 40 per cent in the F_1 generation. When 2 heads of (1) the same plant, (2) closely related and (3) not closely related plants were enclosed together for fertilization, fertility increased markedly from (1) to (3). —Continuous inbreeding produced strains with yellow, green, and blackish grains. Green (really yellow) was hypostatic to black and yellow to green, involving only 1 Mendelian factor. Green color is due essentially to the aleurone layer, yellow is due to both aleurone and seed coat, and black to seed coat alone. In the cross of yellow-seeded by black-seeded a double xenia effect was found,—the ordinary endosperm effect of green (from the black seeds) upon yellow and also an immediate seed coat effect of black upon yellow. A similar seed coat effect was found in the cross, green by black-seeded.—*L. R. Waldron.*

896. Steiner, G. **Intersexes in nematodes.** Jour. Heredity **14**: 147–158. *12 fig.* 1923. —Large numbers of intersexes are reported in *Mermis albicans, Agamermis deacudata,* and related forms. All the intersexual individuals were females, with a complete and functional female reproductive system. The intersexual characters appear only in the tail end, where the male sexual organs are located. A completely graded series of forms was observed, from females with only a trace of male tissue to those in which the entire reproductive system of the male is present. The cause of this condition is believed to be that there are a large number of closely related forms living together in the soil. Intercrossing of these produces the intersexes, as was the case with the intersexes produced experimentally in *Lymantria* by Goldschmidt. It is found in the larval stage that ⅔ of the body of *Agamermis decaudata* is dropped, and only the head end develops into the adult. Thus, all parts analogous to the anal region are lost by this remarkable process of self-amputation. Therefore, the openings in the tails of the intersexual females are not rudimentary anal openings. Intersexes are reported (under the name of hermaphrodites) by a number of other authors in widely different groups of nematodes.—*R. C. Cook.*

897. Stuart, W. **Potato breeding, selection and seed development work in the United States.** Potato Mag. 5^3: 5, 18, 19, 22, 23. 1922; 5^4: 9, 12, 13, 21. 1923.—This is a slightly abridged reprint of an article of the same title in Rept. Internat. Potato Conference, Roy. Hort. Soc. London, Nov. 16–18, 1921.—*D. Folsom.*

898. Thacker, A. G. **Dr. Kammerer in Cambridge.** Sci. Progress **18**: 136–138. 1923.— A critical account and discussion are presented of a lecture by Kammerer on his experiments on the inheritance of acquired characters and an exhibit of his specimens, both given under the auspices of the Natural History Society of Cambridge on Apr. 30, 1923, and officially reported in Nature, May 12, 1923. The chief criticisms were the lack of exact essential scientific statements and the narrow range of the phenomena described, "too narrow to form the basis of any far-reaching generalization on such an immensely important subject as the inheritance of acquired characters."—*Orland E. White.*

899. Torres, J. P. **Some notes on rice hybridization work.** Philippine Agric. Rev. **16**: 46–48. *2 pl.* 1923.—The author describes the "method of hybridizing" in rice hybridization work, giving directions as to when and how to emasculate the flowers, the gathering and keep-

ing of the pollen, the pollination process, labeling and keeping of note book records.—*Dorothy I. Neff.*

900. Ubisch, G. von. **Beitrag zu einer Faktorenanalyse von Gerste.** [**Contribution to a factorial analysis of barley.**] Ber. Deutsch. Bot. Ges. **41**: 79–84. 1923.—In crosses of awnless barleys with awnless, awnless with short and long awned, and awnless with hooded the writer obtained the following results in the F_1 generation: awnless with awnless gave only awnless; awnless with certain short awned forms gave awnless and with others hooded; awnless with hooded gave hooded. The writer explains his results on the basis of 4 factor pairs, *Aa*, *Kk*, *Ss*, and *Ii*, independently inherited. Either *A* or *K* alone gives awned condition. *A* or *K* with *I* gives long awns and with *i* short awns. Factors *A* and *K* together produce hooded. Factor *S* dominates either *A* or *K* and produces awnless condition. The hooded condition—*A* + *K*—is reduced in the presence of *S* but not completely covered up. On the basis of this explanation the following genotypes are possible: awned barleys are *AAkkss*, *aaKKss*, and *aakkss;* with *I* these will be long awned and with *i* short awned. Hooded barleys are *AAKKSS* and *AAKKss*, the first much reduced; all common hooded barleys are *AAKKss*. Awnless barleys are *AAkkSS* and *aaKKSS*.—In crosses of deficiens barley with a 6-rowed form the F_1 was 2-rowed. In the F_2 generation the writer obtained 130 2-rowed, 44 6-rowed, 50 deficiens. He explains his results by assuming 2 factors, *Z* and *D*, which together give 2-rowed barley. *D* alone gives 6-rowed and *Z* or *z* with *d* gives deficiens. On this basis one expects a ratio per 16 in the F_2 generation of 9 2-rowed : 3 6-rowed : 4 deficiens. In the F_2 generation, 206 individuals were grown. The numbers expected were 126 2-rowed, 42 6-rowed, and 56 deficiens; the observed numbers were 130, 44, and 50 respectively.—*Fred Griffee.*

901. Uhlmann, Eduard. **Entwicklungsgedanke und Artbegriff in ihrer geschichtlichen Entstehung und sachlichen Beziehung.** [**Evolutionary thought and species concept in their historical origin and essential relation.**] Jena. Zeitschr. Naturwiss. **59**: 1–114. 1923.—The idea of kinds, or species, of organisms, and the idea of evolution, in so far as these ideas have existed, are traced from the early Greeks to the present time. The principal contributions to these conceptions made by the more important writers are discussed, and finally the part played by modern genetics in solving the problem of the species concept.—*H. H. Clum.*

902. Valleau, W. D. **The inheritance of flower types and fertility in the strawberry.** Amer. Jour. Bot. **10**: 259–274. 1923.—The author presents data which support the supposition that the males and hermaphrodites are homozygous for sex chromosomes, while the pistillate plants are heterozygous with respect to the sex-determining factors. Under discussion, a Mendelian interpretation of sex in plants is defended.—*Richard Wellington.*

903. Vuillemin, Paul. **Variation et fluctuation dans le nombre des stigmates de Papaver.** [**Variation and fluctuation in the number of stigmas in Papaver.**] Compt. Rend. Sci. Paris **177**: 444–445. 1923.—The author reports experiments by Blaringhem on variation in the number of stigmas in *Papaver somniferum* caused by the addition of nitrogenous fertilizer to the soil, and similar experiments by himself on *P. bracteatum.* The stigma number fluctuates according to the richess of the soil, but as the check plants did not furnish a fixed standard, it was impossible to measure these fluctuations exactly. Nor has it been established that the limits of normal fluctuation have been extended.—*Dorothy I. Neff.*

904. Walter, Heinr. **Haakenblumige Cyclamen und andre Mangel in der Cyclamenzucht.** [**Hook-flowering Cyclamen and other faults in Cyclamen breeding.**] Möllers Deutsch. Gärtnerzeitg. **38**: 117. 1923.—Emphasis is laid upon the hook-shaped curvature in the petals caused by the sepals, which are found especially in flowers with broad petals. This form is produced in the bud. The variety Persicum splendens was free from this characteristic 40 years ago, but the profusely flowering Tubbenthal strain shows this unsightly character in almost all cultures. By careful selection, over years, it can be remedied. Breeders should not select, in this case, plants having more than 5-petaled flowers, because the calyx space is then too small for proper development of the petals.—*J. C. Th. Uphof.*

905. Wiegand, Walther. **Die rassenhygienischen Anschauungen Johann Peter Franks.** [**The race hygiene of Johann Peter Frank.**] Arch. Rass.- u. Ges. Biol. **14**: 395–415. 1923.—The physician John Peter Frank was born in 1745 and spent most of his life in Göttingen, Vilna, Freiburg, and Vienna, dying in 1921 at the last. His publications, which were largely con-

cerned with matters relating to public health, contain much of what today is classed under the head of eugenics. He showed an unusual appreciation of the importance of heredity in pathology and medicine, perceived the importance of animal and plant genetics, and recognized the significance of geographical isolation in the fixing of human types. His policy was one of racial upbuilding with a constructive program of municipal improvement. He seems to have been ignorant of, or wholly unimpressed by, the teachings of Malthus.—*C. H. Danforth.*

906. Willey, Arthur. **Selection and segregation.** Nature 111: 602. 1923.—Natural selection is qualitative while specific differences are essentially quantitative. Genetics deals with unit character analysis and exploits favored individuals, while natural selection is concerned with character combination and preserves favored races. The former gives novelty to a species and the latter quality to a genus. Natural selection holds evolution within bounds and assigns organisms to their place in nature. An example of leaf mimicry by a fish genus (*Platax*) is instanced.—*L. R. Waldron.*

907. Witschi, Emil. **Ergebnisse der neueren Arbeiten über die Geschlechtsprobleme bei Amphibian.** [**Results of recent work on the sex problem in Amphibians.**] Zeitschr. Indukt. Abstamm.- u. Vererb. 31: 287–312. 1923.—The data upon the sex-determining mechanism in Amphibia is reviewed, with emphasis upon Anurans under the following heads: (1) data upon adult and larval hermaphroditism; (2) the evidence for the genetic constitution of the "differentiated" race of frogs (males heterozygous for sex), and of "undifferentiated" race (factors for sex very nearly homozygous and equipotent in both sexes, temperature operating upon the trophic conditions finally differentiating the sexes, Goldschmidt's scheme being applied in explaining genetic results); (3) cytological data (possibly an XY pair present in the male of the differentiated race); (4) effect upon sex differentiation of (a) different kinds of food (negative), (b) starvation (when followed by feeding effects a change from testis to ovary in Triton), (c) hyper- and hypotonic solutions applied to eggs (former may increase number of females, latter may increase number of males), (d) temperature (in "differentiated" race, cold delays differentiation and produces larval hermaphrodites, as is normal for "undifferentiated" race, instead of males and females; heat (about 27°C.) hastens differentiation and finally produces excess of males. In "undifferentiated" race, cold followed by heat transforms females into males). (e) Uterine overripeness (produces excess of males up to 100 per cent); (5) numerous experiments upon relation of germ glands, Bidder's organ, and nervous system, to somatic characters.—*C. L. Parmenter.*

908. Zade. **Erfahrungen mit der neuzeitlichen Sortenversuchsmethode.** [**Experiences with modern varietal testing methods.**] Beitr. Pflanzenzucht 6: 11–20. 1922. *Discussion p. 21–24.*—The writer discusses variety testing methods, sources of error in the methods in use, and the results of some of his own variety tests.—Uniformity of soil and methods of cultivation are primary requisites for making variety tests. In striving for the greatest uniformity of conditions, purity and germination of seed and 1,000-kernel weight are used as standards for the measurement of quantity of seed in order to produce the same number of plants on unit areas. The writer made tests with barley, oats, wheat, rye, beans, and peas during 4 seasons and with 5–6-fold repetition of plots and found that, while the 1,000-kernel weight might be an accurate standard of measurement for some crops, it was not reliable for cereals unless seed grown and harvested under the same conditions was used. The greatest differences were found in oats and barley and proportionately smaller differences in winter and spring wheat and rye. If, for instance, 2 varieties of oats of approximately the same 1,000-kernel weight were tested with the same drill adjustment, one would drop 41 pounds to only 26.5 pounds of the other variety in the same period of time. There would thus result a great difference in the number of plants in a plot. The error is due to the technique of drill adjustment. Short threshed oats, from which the awn and glume tips are broken, drop considerably more kernels with a given drill adjustment than long threshed oats with the awns and glume tips intact.—Since weight per l. takes into consideration the bulkiness of the kernels he also tested this as a standard for measurement of amount of seed sown, but found it not entirely reliable.—The writer agrees with von Rümker that original seed should not be used for variety tests, but instead the progeny of this seed which has been grown, threshed, and sorted under the same condition. If this is done the 1,000-kernel weight may be used as a standard.—The author

insists on the necessity of perfect seed for variety tests and does not test seed with a germination and purity of less than 97 per cent. His method is to test first the purity and germination. The 1,000-kernel weight is then taken and the drill tested with each variety and adjusted so that the desired number of kernels fall. To get this number he takes the weight falling over a given area and reckons the number of kernels from the 1,000-kernel weight. In this way he claims 2 persons can in a day work up 20–25 oat varieties.—Theoretically, he says, it may not be best always to have the same number of plants of all varieties on a given area because of the differences in stooling and other growth characters; but practically it is the best method. —Working the borders of plots is also a source of error because some varieties grow out over the borders more than others. For exact results border working should be reduced as much as possible. He describes several methods with which he has tried to eliminate this source of error but none was entirely successful.—The greatest source of error in variety testing has to do with the kind and manner of harvesting. Because varieties ripen at different times they are harvested under different weather conditions and results are not comparable.—His method is to cut all plots of any 1 set at the same time—when beginning to turn yellow—and to get the total weight of each plot. A test sheaf about $\frac{1}{15}$ the total weight is then taken. From some stalks of this sheaf dry substance determinations are made of kernels and straw. The test sheaf is threshed, the kernel weight determined, and the weight of straw and chaff reckoned from the total. He considers this more accurate than the Wagner method.—*Charlotte Elliott.*

909. Zinn, Jacob. **Correlations between various characters of wheat and flour as determined from published data from chemical, milling, and baking tests of a number of American wheats.** Jour. Agric. Res. 23: 539–548. 1923.—This posthumous paper deals with statistical studies of data compiled from publications of various experiment stations with a view to determining correlation of different forms of proteins with milling and baking tests. Significant positive correlations were obtained between crude protein content in the wheat, and dry gluten, gliadin in the wheat and protein in flour. Loaf volume, which determines the commercial value of bread, was found to be generally closely correlated with amount of crude protein in the wheat and flour, dry or wet protein, quality of gluten, and to some extent with gliadin. Dry gluten content and gliadin were generally highly correlated. Capacity of dough to absorb water showed no significant relation to flour yield, gliadin, dry gluten, crude protein, or loaf volume. There seemed to be apparently no correlation between amount of crude protein in the grain and flour yield. Loaf volume being closely correlated with protein in flour, and the latter with crude protein in the grain, it is stated that breeders, during the early stages of selection, can, for practical purposes, determine quality of loaf by a simple chewing test of the grain.—*S. Boshnakian.*

HORTICULTURE

J. H. Gourley, *Editor*
John Bushnell, *Assistant Editor*

(See also in this issue Entries 633, 645, 656, 669, 696, 703, 707, 760, 800, 834, 866, 868, 1025, 1071, 1090, 1097, 1120, 1211, 1237)

FRUITS AND GENERAL HORTICULTURE

910. Anonymous, **De economische toestand van Suriname in 1922. [The economic condition in Surinam in 1922.]** *46 p.* Paramaribo, 1923.—An economic review is given of the production, marketing, prices, etc., of cocoa, coffee, rice, and lumber in Surinam.—*J. C. Th. Uphof.*

911. Anonymous. **Planting and reconstitution of vineyards. Conditions governing the distribution of Phylloxera-resistant vine rootings and cuttings.** Jour. Dept. Agric. Victoria 20: 314–315. 1922.

912. Anonymous. **Stretching the harvest through the winter.** Sci. Amer. 129: 180–181. *3 fig.* 1923.—This is a graphic survey of the output of America's canning industry in the years 1919–21.—*Chas. H. Otis.*

913. Anonymous. **The use of paper in gardening.** Sci. Amer. 129: 167. 1923.—The use of oiled paper in place of glass in greenhouses and cold frames is described.—*Chas. H. Otis.*

914. Adam, D. B. **The pre-cooling of fruit for export. Some aspects of the question.** Jour. Dept. Agric. Victoria 20: 607–609. 1922.—The problem is discussed from the standpoint of trans-oceanic shipment.—*Wm. E. Lawrence.*

915. Auchter, E. C., and W. R. Ballard. **The influence of various systems of grape training on fruit production.** Maryland Agric. Exp. Sta. Bull. 250. *207–234, 22 fig.* 1922.—An experiment involving 5 methods of training grapes was begun in 1911 and data on yield for each method in 1916, 1917, 1919, and 1920 are presented for the Worden, Concord, and Lutie varieties. The conclusion reached is that for Maryland conditions the Single Stem Four Cane Kniffin system is most satisfactory.—Systems dependent on spurs for the production of fruit-bearing shoots were generally not so productive as those in which the shoots develop from longer canes. This is thought to be due to the fact that the first 3 buds on a cane are generally less productive than those further from the base. Buds 5–10 along the cane seemed to be most productive. The practice of summer pinching of the vines proved of questionable value.—The 5 methods of training under experiments are described and illustrated in detail and briefer descriptions of several other methods are included.—*J. T. Rosa.*

916. Blakeslee, A. F., and M. E. Farnham. **Bottle grafting.** Jour. Heredity 14: 171–173. *1 fig.* 1923.—This is a method of grafting in which the end of the scion is allowed to project and is placed in a bottle of water. The authors have found bottle grafting very useful in working with *Datura* and the method may be of value to other plant experimenters.—*R. C. Cook.*

917. Crowe, R. **Experiments in the cool storage of citrus fruits.** Jour. Dept. Agric. Victoria 20: 121–122. 1922.—There was less loss of wrapped oranges and lemons than of unwrapped.—*Wm. E. Lawrence.*

918. Davidson, John. **Commercial drug plant cultivation in British Columbia.** Sci. Agric. 3: 285–289. 1923.—The possibilities of the establishment of a drug-growing industry in British Columbia are discussed. It has been found that among other drug plants the Cascara tree (*Rhamnus Purshiana*), Belladonna (*Atropa belladonna*), foxglove (*Digitalis purpurea*), hemlock (*Conium maculatum*), Ajowan (*Carum copticum*), are all native to the province and may be profitably cultivated.—*T. G. Major.*

919. Eggert, Fr. Paul. **Erdbeere "Rotkäppchen."** [Strawberry "Rotkäppchen."] Möllers Deutsch. Gärtnerzeitg. 38: 143. 1923.—The fruit of this variety is of medium size, long pointed, early, and recommended for forcing.—*J. C. Th. Uphof.*

920. Elgar, Walter R. **The planting, cultivation and general management of orchards in Kent.** Jour. Roy. Agric. Soc. England 82: 117–131. 1921.—The selection of location, planting, and care of orchards are discussed.—*A. C. Arny.*

921. Evengelides, Charles. **Model olive plantation.** Cyprus Agric. Jour. 18: 58. 1923.—The author placed his olive orchard at the disposal of the Cyprus Department of Agriculture to be cared for as a model orchard. The trees were pruned, ditched, and manured the first 2 years in November and as a result yielded 15 per cent more the 1st year and 30 per cent more the 2nd than olive trees not so cared for. The fruit was also superior and the trees much more vigorous. A 60 per cent increase is expected in the 3rd year.—*W. Stuart.*

922. Gardner, V. R. **Studies in the nutrition of the strawberry.** Missouri Agric. Exp. Sta. Res. Bull. 57. *30 p.* 1923.—The nutritive conditions to which strawberry plants were subjected were varied by the use of 2 soil-types, by defoliation, and by fertilization. Temperature and moisture conditions were so controlled that neither was a limiting factor. Maximum production of flower clusters, flowers, and berries was correlated with greatest accumulation of carbohydrates at the time of fruit-bud differentiation the preceding fall. Production of flower clusters, flowers, and berries, as well as setting of the pistils and of the flowers, was affected by nutritive conditions in the plant during the fall and winter preceding fruiting, but was practically uninfluenced by fertilizer treatment in the spring up to the time of fruiting. Size of berry was correlated with number of pistils per flower and the setting of these pistils. Good conditions of nutrition the preceding fall increased the size of the berries, but fertilization in the spring had little effect. There is a progressive decrease in number of pistils per

flower, and consequent decrease in size of berry, from the earliest to the latest flower to open on the inflorescence. Low carbohydrate and low starch content at the time of fruit-bud differentiation led to the production of female flowers in a normally hermaphroditic variety. It is suggested that lower carbohydrate content is associated with the female condition, higher carbohydrate content with the male condition, and an intermediate carbohydrate content with hermaphroditism.—*A. M. Burroughs.*

923. Hatton, R. G. **Progress in methods of modern fruit growing.** Jour. Roy. Agric. Soc. England **82**: 49–117. 1921.

924. Hodgson, Robert W. **The pruning of citrus trees in California.** California Agric. Exp. Sta. Bull. 363. *490–532.* 1923.—There is a tendency in California to abandon heavy pruning of citrus trees and adopt a method of light or moderate pruning. Pruning when trees are young delays bearing and pruning of older trees tends to induce vegetation at the expense of fruit. Old, unproductive trees are sometimes benefited by severe pruning by affecting the carbon-nitrogen ratio.—But some pruning is necessary since unpruned trees become too large for economical handling and the denseness of unpruned ones inhibits fruitfulness in the interior. Individual trees occur in nearly all citrus varieties that are excessively vigorous. These "wild tops" and "two-story trunks" of unpruned navel oranges and long, spindling, decadent tops of Valencia orange and lemon trees require more severe pruning for elimination. Much propping could be eliminated by proper training of the trees, especially where high wind is prevalent.—Two types of growth are recognized in citrus trees. Fruit wood is slow-growing, pendant, small-leaved, fine stemmed, and fruits early and abundantly. The vegetative wood is vigorous, fast-growing, upright with large leaves, coarse-grained, and with a terminal fruiting tendency.—The characteristics of decadent citrus trees in the order in which they usually appear are (1) increase in percentage of small-sized fruit; (2) decrease in total yield; (3) dwarfed foliage, starting in the tops of the trees; (4) superabundance of weak or leafless fruit spurs; (5) heavy production of weak blossoms, mostly abortive; and (6) gradual development of chlorosis. The skeletonizing system of pruning is recommended for such trees rather than severe heading back. It distributes the pruning response throughout the tree instead of localizing it.—Frost-injured trees should not be pruned for a year after injury. Late summer or fall pruning is undesirable as it encourages late growth, but rather in late winter or early spring for navel oranges and during the summer months for Valencia orange and lemon trees. Details of pruning the various fruits and emphasis on the treatment of water sprouts are also given.—*A. R. C. Haas.*

925. Howard, W. L. **A modern Italian nursery.** American Nurseryman **38**[4]: 84–85. 1923.—The nursery of Fratelli Sgaravatti, of Saonara (Padua), which is 125 years old, is described. The firm owns and operates 420 acres of land. It does a general nursery business including ornamentals and vegetable seeds, and grows fruit seedlings extensively for export trade. Methods employed and management are outlined.—*J. H. Gourley.*

926. Prescott, E. E. **Orchard notes.** Jour. Dept. Agric. Victoria **20**: 383–384. 1922.—Timely advice concerning the best methods of planting and spraying deciduous fruit trees is given.—*Wm. E. Lawrence.*

927. Rimes, R. D. **What is claimed for Rimes' blight-proof Pineapple pear.** Amer. Nurserymen **38**[4]: 86, 94. *1 fig.* 1923.—History and characteristics of this new pear, attracting wide attention in U. S. A., are given.—*J. H. Gourley.*

928. Savastano, Giulio. **L'agrumicoltura sorrentina durante il periodo 1915–1921. [Citrus culture in the Sorrento region during the period 1915–1921.]** Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **5**: 160–186. *Pl. 1–4.* 1919–1921.—Soils, varieties, biology of the citrus plants, the nursery, grafting practices, consociations, fertilizing, cultural cares, windbrakes, frost protection, harvest, etc., are considered in their local aspect. Notes are appended on marketing, choice of the marketable fruit, and other economic notes of local interest.—*A. Bonazzi.*

929. Shepherd, A. N. **Apples on the Murrumbidgee irrigation areas.** Agric. Gaz. New South Wales **34**: 595–596. *2 fig.* 1923.

930. Stahel, Gerold. **Handleiding voor het oculeeren van cacao. [Guide for budding cacao.]** *17 p., 19 pl.* Dept. Landb. Suriname: Paramaribo, 1923.—Recent work at the Experi-

ment Station has changed the prevailing method of propagating cacao. Ten years ago budding was seldom practiced but now 80–98 per cent of the buddings are successful. Strong-growing seedlings are selected for stock and are transplanted into well shaded beds and spaced 1½x2 feet when they have 2–3 leaves. Plants grown on clay soils are somewhat better than those grown on sand. The stems are 2–3 cm. thick when budded and must be densely shaded. Older trees can be budded on water sprouts arising near the ground when the main stem is cut off. The best method of budding is Forkert's (without lip); the buds must be taken from ripe wood.—*J. C. Th. Uphof.*

931. Stock, D. T. **Orange growing in the Shan States.** Agric. Jour. India 17: 577–583. 1922.—A primitive cultivation of oranges in the Northern Shan States of Burma is described and suggestions are made for its improvement.—*A. Howard.*

932. Uphof, J. C. Th. **Im "Obstgarten Hollands."** [In the "Fruitgarden of Holland."] Möllers Deutsch. Gärtnerzeitg. 38: 158–159, 166, 173, 174. *7 fig.* 1923.—In the Betuwef province of Gelderland about 6,200 hectares are in orchards. Soil and economic conditions are described. The fruit is sold at auction and net returns are 600–700 gulden per hectare; where the trees are intercropped with berries, etc., the returns are 1200–1800 gulden. Meikers (May cherry), Variksche Zwarte (Varik Black), and Bunte Spanische cherries are grown. Many varieties are self-sterile. Cherry and apple trees are often interplanted. The following apples are grown as standards: Goldreinette, Brabanter Bellefleur, and Sternapfel; and Codlin Keswick, Yellow Transparent, and Cellini as dwarfs. Maagdepeer (Virgin pear), Beurre Hardy, B. de Merode, Jan Blaasjes, and Clapps Favorite pears are grown as standards; and Clairgeau, Beurre Hardy, William Duchess, and Clapps Favorite as dwarfs. Other fruits grown are: Reine Claude, Belle de Louvain, and Eldensche Blauwe (Blue of Elden) plums; Hollandische Rote (Dutch Red) currant; Crownbob gooseberry; Hornet and Superlative raspberries. Amsden and Montague peaches are grown against walls or under glass. A peculiar intercropping of basket willows between standard trees is found near Dodewaard. Walnuts are grown only as shade trees along country roads.—*J. C. Th. Uphof.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

933. Anonymous. **Crepe myrtles.** Nation. Nurseryman 31[9]: 230. 1923.—*Lagerstromeria indica* and its adaptation to yard planting is discussed for locations south of Washington, D. C. It usually grows to a height of 10–12 feet but there are dwarf forms in red, pink, and blue that would lend themselves to pot culture.—*J. H. Gourley.*

934. Beseke, Gustav. **Lachsfarbige Cyclamen.** [Salmon-colored Cyclamen.] Möllers Deutsch. Gärtnerzeitg. 38: 114. *1 fig.* 1923.—Salmon-colored varieties are in demand. About 25 years ago the Froebel company of Zürich introduced Salmoneum. Recent varieties are Perle von Zehlendorf and Rosa von Zehlendorf.—*J. C. Th. Uphof.*

935. Brotherston, R. P. **Miss Maling on flowers.** Gard. Chron. 72: 310. 1922.—Two books published in 1862 on flowers for ornament and directions on arrangement are reviewed.—*P. L. Ricker.*

936. Brown, E. **Some Seganda orchids.** Gard. Chron. 72: 239, 265, 295. *Fig. 97, 107, 119.* 1922.—Notes are given on the normal habitat conditions of such African orchids as *Lissochilus, Eulophia, Bonatea, Angrecum, Listera,* and *Polystachya* and suggestions for their successful culture.—*P. L. Ricker.*

937. Bulin, F. **Ageratum "Schneeflocke."** Möllers Deutsch. Gärtnerzeitg. 38: 130–131. *1 fig.* 1923.—Schneeflocke is a white, large-flowering, dwarf variety, recommended for carpet bedding and as a cut flower. It can be propagated from seed.—*J. C. Th. Uphof.*

938. Cranfield, W. B. **Hardy British ferns.** Gard. Chron. 73: 137–138. *Fig. 66.* 1923.—A few of the 30–40 native species and their variations are mentioned briefly and a list of 80 slides shown at a lecture is given.—*P. L. Ricker.*

939. Dlabka, Johannes. **Gangbare Cyclamen.** [Fashionable Cyclamen.] Möllers Deutsch. Gärtnerzeitg. 38: 116–117. 1923.—Under proper cultivation Cyclamen will flower from September to March. When bloom is desired in October seed is sown in September of the previous year. The best varieties are Leuchtendrot, Dunkelrot, Perle von Zehlendorf, Rosa

von Zehlendorf, Rosa mit Auge, Reinrosa, Weiss mit Auge, Reinweiss, and Victoria. Rokoko and Fliederfarben are less popular. The Dlabka Harlekin, a 1923 novelty, has large striped flowers.—*J. C. Th. Uphof.*

940. Free, Montague. **The rock garden.** Brooklyn Bot. Gard. Leaflets 11^6: 1–3. 1923. —This is a reprint, with revision and additions, of Leaflets 7^3: 1919. It describes the methods followed in the construction of the rock garden in the Brooklyn Botanic Garden, with information about rock gardens in general.—*A. H. Graves.*

941. Geier, M. **Langtriebige Edelrosen als Wandbekleidung.** [**Long-stemmed improved roses as wall coverings.**] Möllers Deutsch. Gärtnerzeitg. 38: 138, 150–151, 180–181. 1923.—A consideration of the following rose varieties suitable for wall covering is presented: Marechal Niel, Gloire de Dyon, Mme. Jules Graveraux, Billard et Narrée, Tea Rambler, Reine Marie, Henriette, Erzherzogin Maria Dorothea, Bouquet d'or, Rêve d'or, Frau Karl Druschki, Crimson Rambler, Johanna Sebus, and some others.—*J. C. Th. Uphof.*

942. Hay, T. **Dahlias for parks and gardens.** Gard. Chron. 72: 270, 286. 1922.—This paper, read at the Dahlia Conference, Royal Horticultural Hall, Westminister, Oct. 17, 1922, describes the best and most popular varieties for various park sites.—*P. L. Ricker.*

943. Heal, John. **Choice indoor flowering plants.** Gard. Chron. 72: 296. 1922.—Notes are given on *Luculia gratissima, Medinilla magnifica, Camaserna panicea, Gloneria jasminiflora, Reinwardtia tetragyna,* and the Franciseas.—*P. L. Ricker.*

944. Hoffman, Franz. **Österreichische Dahlien Neuheiten.** [**Austrian dahlia novelties.**] Möllers Deutsch. Gärtnerzeitg. 38: 140–141. 1923.—The following valuable 1922 Dahlia varieties of Austrian origin are described: Frau Anna Walter, Steffan Nardai, Frau Genofera Dittrich, Vicebürgermeister Palka, Bürgermeister Anton Offenbock, Volksdichter Joh. Leitner, Generaldirektor Skapinelli, Nat. Rat. Franz Birbaumer, Bundes-President Mich. Hainisch, Schneeberg, Gartenarchitekt A. O. Schneider, and Frau Ida Engel.—*J. C. Th. Uphof.*

945. Lynch, R. Irwin. **Thladiantha dubia.** Gard. Chron. 72: 371. 1922.—This is one of the most ornamental of hardy cucurbits in Great Britain, growing from a tuber. Its roots, growing habits, and flowers are described.—*P. L. Ricker.*

946. Müller, Gustav. **Asparagus verticillatus.** Möllers Deutsch. Gärtnerzeitg. 38: 169. *1 fig.* 1923.—This ornamental vine withstands the winter in Germany.—*J. C. Th. Uphof.*

947. Pintal, Ernest. **Jardins paysagers et florifères.** [**Floral and landscape gardening.**] Sci. Agric. 3: 360–362. 1923.—The writer briefly discusses 3 types of garden,—natural, architectural, and picturesque,—and gives short notes on the method of making a garden.—*T. G Major.*

948. Proschowsky, A. Robertson. **Palms of the Riviera.** Gard. Chron. 72: 225, 283, 368. 1922; 73: 136. 1923.—Among the Riviera palms resembling *Livistona australis* is L. *decipiens* Becarri. Its original habitat is unknown, but is supposed to be Australia. It has red leaves when young and is quite hardy.—The American Sabals, sparingly represented in the Riviera gardens, have proved absolutely hardy, even under the Dec., 1920, frost, the heaviest since 1820. *S. Adansonii* is most commonly represented, of which 6 transitional forms have been recognized by Beccari. *S. palmetto* is the next best represented. The author desires to receive Sabal seed in exchange for other palm seed.—Notes are given on the fan-leaved palms,—*Trithrinax, Nannorhops,* and *Rhapidophyllum.*—The species of *Rhapis* and *Arenga* are discussed as to their nature and cultivation.—*P. L. Ricker.*

949. Purpus, C. A. **Lycianthes peduncularis.** Möllers Deutsch. Gärtnerzeitg. 38: 130. *1 fig.* 1923.—This Solanaceous plant from Mexico can be grown easily in dry soil. The stems die before winter, and the tubers are stored in the greenhouse.—*J. C. Th. Uphof.*

950. Razen, Aug. **Lohnende Hortensien-Kultur für die Erwerbgärtnerei.** [**Profitable Hortensia culture.**] Möllers Deutsch. Gärtnerzeitg. 38: 121–122. 2 fig. 1923.—The author makes cuttings in February, March, and later when smaller individuals are desired. Cuttings are started in sand, protected from the direct sun's rays, then transferred to 7 cm. pots. Soil mixtures, repotting and handling are described. Forcing starts in January; if held at 20°C. the plant flowers in March.—*J. C. Th. Uphof.*

951. Stoger, Ad. **Das Alpenveilchen als Pflückblume.** [The Cyclamen as a cut flower.] Möllers Deutsch. Gärtnerzeitg. 38: 113–114. *1 fig.* 1923.—The Cyclamen is one of the important winter flowering plants of recent years. As a cut flower it became more prominent after the war on account of change of economic conditions in Germany. Flowers are cut until the plants reach saleable size.—*J. C. Th. Uphof.*

952. Tomlinson, A. H. **Free growing roses for the home garden.** Sci. Agric. 3: 290–291. 1923.—Several lists of varieties are given.—*T. G. Major.*

953. Turke, Rob. **Erfahrungen in der Kreuzung der Rosen.** [Experiences in crossing roses.] Möllers Deutsch. Gärtnerzeitg. 38: 153–154, 174–175. 1923.—A general review is presented of various kinds of roses used in hybridizing.—*J. C. Th. Uphof.*

954. Walter, Heinr. **Cyclamen-Neuheit "Feuergarbe."** [Cyclamen novelty "Feuergarbe."] Möllers Deutsch. Gärtnerzeitg. 38: 114. *1 fig.* 1923.—Flowers of this variety, originated by the author, are garnet red and of medium size. The plants resemble *splendens giganteum*, flowering profusely and having a compact growth habit and round, dark green leaves.—*J. C. Th. Uphof.*

955. Walter, Heinr. **Silberblätterige Cyclamen.** [Silver-leaved Cyclamen.] Möllers Deutsch. Gärtnerzeitg. 38: 118–119. 1923.—Certain of the present Cyclamen varieties originated from Weiss mit Rotem Auge possess ornamental white variegated leaves. There are various forms with different flower colors.—*J. C. Th. Uphof.*

956. Walter, Heinr. **Sternblütige Lemania Cyclamen.** [Star-flowering Lemania Cyclamen.] Möllers Deutsch. Gärtnerzeitg. 38: 123–124. *1 fig.* 1923.—This form has narrow petals. Most individuals are heterozygous and further careful breeding is recommended.—*J. C. Th. Uphof.*

957. Weigelt, Karl. **Die Cyclamensamen-Kultur vor fünfzig Jahren und heute.** [Cyclamen-seed growing fifty years ago and at present.] Möllers Deutsch. Gärtnerzeitg. 38: 133–134. 1923.—About 1871 Cyclamen were usually propagated by division of the tuber, resulting in hundreds of small flowers to each plant. The first improvement took place in Saxony in 1874 when Richard Müller introduced *C. persicum* in Dresden-Striesen, and Paul Lange made an exhibition in Leisniz. Karl Stoldt in Wandsbeck produced the first novelty, Rosa von Marienthal, followed by Käthe Stoldt with ivory white flowers. Lange probably used *C. persicum universum* from Williams of London in his hybridizations. In 1883 Karl Riedel of Worms exhibited the beautiful Krimhilde varieties of which the darkest was called Ruhm von Worms. In 1893 Draps-Son from Laeken exhibited his Papilio race in Geneva, from which Danker of the firm J. S. Schmidt in Erfurt originated the Rokoko race. In 1896 the firm Froebel in Zürich produced the salmon-colored Salmoneum, and from this the present large flowering salmon-colored giganteum varieties have come.—*J. C. Th. Uphof.*

958. White, J. E. G. **Wet weather roses.** Gard. Chron. 72: 366. 1922.—The effect of wet weather on standard varieties is noted and a list of good and moderate wet weather-resisting varieties is given.—*P. L. Ricker.*

VEGETABLE CULTURE

959. Geise, F. W. **Experiments with inoculated sulphur.** Virginia Truck Exp. Sta. Bull. 42. *259–263.* 1923.—Inoculated sulphur applications gave partial control of the potato scab organism on several experimental fields of early crop Irish Cobbler potatoes in Virginia. Three hundred pounds of inoculated sulphur per acre gave the better control in proportion to the amount of material used. The residual sulphur showed no ill effects on a following crop of soy beans. Spinach following the soy beans failed to produce a marketable crop where 600 pounds of inoculated sulphur had been applied to the early potato crop. Field corn planted as an intercrop in potatoes on treated land had the yield reduced when amounts of sulphur as small as 300 pounds per acre were applied.—*H. A. Jones.*

960. Hamel, Claude C. **The chayote.** Florida Grower 28[1]: 6. 1923.—*Chayote edulis* is a Guatamalan tropical perennial vine of the Cucurbitaceae. It is easily grown. At present it is mostly produced in Florida and Louisiana although the roots live over winter as far north as South Carolina. The ivory white fruit varieties are most marketable.—*J. C. Th. Uphof.*

961. Harris, S. G. **Onion production in Victoria.** Jour. Dept. Agric. Victoria 20: 1–9, 91–104. *18 fig.* 1922.

962. Schinz, Hans. **Der Pilzmarkt der Städte Zürich und Winterthur der Jahre 1920 und 1921 im Lichte der stadtischen Kontrolle.** [The mushroom market of Zürich and Winterthur for 1920 and 1921 in the light of municipal control.] Vierteljahrsschr. Naturf. Ges. Zürich 67: 109–131. 1922.—Lists of species, notes on poisonous mushrooms, and a list of mushroom manuals useful in identification are given.—*John H. Schaffner.*

963. Woodbury, C. G. **The production of tomatoes from the canners' standpoint.** Rept. Maryland Agric. Soc. 7: 334–346. 1922 [1923].—The author cites the necessity of improving the quality and increasing the yield of canning tomatoes by using higher grade seed, growing more vigorous plants for transplanting, and practicing better methods of field cultivation and fertilization. High acre yields lower the cost of production per ton, yield the grower and canner fair profit, and permit a reasonable price to the consumer.—*H. A. Jones.*

HORTICULTURAL PRODUCTS

964. de Castella, F. **Casse. Wine defects not directly caused by micro-organisms.** Jour. Dept. Agric. Victoria 20: 418–431, 481–490, 615–621, 673–679. 1922.

965. Knight, A. **Crystallized, candied, and glazed fruits for home use.** Jour. Dept. Agric. Victoria 20: 112–116. 1922.

966. Krone, Basil. **Standard packing for export, with ready reckoner for the packing shed.** Jour Dept. Agric. Victoria 20: 261–279. *Fig. 1–17.* 1922.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 733, 751, 752, 860, 887, 890, 1047, 1050, 1052, 1059, 1060, 1117, 1188, 1268)

967. Brown, E. **Buttressed and stile-rooted trees.** Gard. Chron. 73: 174. *Fig. 80–81.* 1923.—Notes are given on buttressed trees in dry forests in Africa as compared with the stile-rooted types of swamps.—*P. L. Ricker.*

968. Hale, J. D. **Trabeculae of Sanio in angiosperms.** Science 57: 718. 1923.—These trabeculae, common to gymnosperms, are here reported for angiosperms in the secondary wood of the stem of *Alnus oregona* Nutt.—*C. J. Lyon.*

969. Rogers, Lenette M. **Development of the prothallium of Lygodium palmatum.** Bot. Gaz. 75: 75–85. *Pl. 4–6.* 1923.—Material was collected near South Hadley, Massachusetts. The development of the prothallium is unusual in the 1st division of the spore by a wall horizontal to the crack, the outer cell giving rise to the rhizoidal cell and the primary prothallial cell, and by the immediate formation of a cell mass. Later, an apical cell is formed and replaced by a group of initial cells. The lobing of the prothallium is symmetrical.—*E. M. Twiss.*

970. Sibilia, C. **Di alcuni esemplari teratologici di Anemone apennina L.** [Some teratological specimens of Anemone apennina L.] Ann. Botanica 16: 154–161. *Fig. 1–3.* 1923.—The author describes anomalies which he groups as follows: (1) petalody of stamens, pistils and leaves of the involucre; (2) variations in the number of the leaves of the involucre; (3) formation of more than 1 flower from the involucre; (4) cohesion of flowers; and (5) misplacement of petals on the floral peduncle.—*P. D. Caldis.*

971. Trelease, William. **Tubeuf's monograph of the mistletoe.** [Rev. of: Tubeuf, Karl von. **Monographie der Mistel.** (Monograph of the mistletoe.) *xii–832 p.* R. Oldenbourg: Munich and Berlin, 1923 (see Bot. Absts. 12, Entry 6694).] Science 57: 643–644. 1923. [See also Bot. Absts. 13, Entry 258.]

972. Wiley, Robert B. **Sperms of Vallisneria spiralis.** Bot. Gaz. 75: 191–202. *Pl. 7–10.* 1923.—The male cells are organized in the pollen grain following division of the generative cell, and are united by their tips until the embryo sac is reached. The sperms become

greatly elongated during their journey through the pollen tube. The tube nucleus may either precede or follow the sperms in the pollen tube. The tube nucleus becomes greatly elongated after leaving the pollen grain, and in its later disintegration probably constitutes the x-bodies so conspicuous in the tips of pollen tubes in the embryo sac. Pollen tubes within the ovarian chamber often form tuber-like enlargements at their tips containing male cells and also x-bodies obviously derived from the tube nucleus. The sperms are released as distinct male cells from the tip of the pollen tube after it enters a synergid. The sperm which unites with the egg possesses cytoplasm about its nucleus when this gamete comes in contact with the egg cell. The 2nd sperm loses its cytoplasm shortly after it enters the embryo sac, and its naked spherical nucleus is carried to the polars in a strand of cytoplasm. A 2nd pollen tube frequently enters the ovule, and this discharges into the remaining synergid. Its male cells seem to remain near the tip of the tube and there is no evidence of polyspermy. The possession of male cells as gametes is not necessarily associated with chalazogamy as reported by Nawaschin, but may be limited to the more primitive orders as he suggests. The union of the male and female gametes as cells probably means that some or possibly all of the cytoplasm of the male cell enters the egg at the time of fertilization.—*B. W. Wells.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 734, 735, 740, 742, 764, 770, 901, 1191, 1313, 1345)

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 1271, 1310, 1314)

973. Anonymous. **Hepatics.** British Bryological Soc. Rept. 1: 33–78. 1923.—The British Bryological Society, the successor of the Moss Exchange Club, distributed 94 species of hepatics during 1923. Of these 19 came from continental Europe, 1 from New Zealand, and the remainder from the British Isles. A few critical notes by D. A. J[ones] and H. H. K[night] accompany the report.—*A. W. Evans.*

974. Anonymous. **Sphagna.** British Bryological Soc. Rept. 1: 13–16. 1923.—The specimens of *Sphagnum* distributed in 1923 all came from the British Isles and include 26 species, most of which are represented by 2 or more varieties or forms. Of the species listed *S. armoricum* Warnst. is new to the British Isles, and several other new vice-comital records are given. A few critical notes by W. R. S[herrin] and J. A. W[heldon] accompany the report.—*A. W. Evans.*

975. Anonymous. **True mosses.** British Bryological Soc. Rept. 1: 17–32. 1923.—The species of mosses distributed number 120, several of which are represented by 2 or more specimens. Although the majority were collected in the British Isles, continental Europe is represented by 24 specimens and more distant regions in the Old World by 6. Critical notes by E. A[rmitage], H. N. D[ixon], D. A. J[ones], W. E. N[icholson], F. R[ilstone], G. B. S[avery] and J. A. W[heldon] are freely interspersed.—*A. W. Evans.*

976. Camus, Fernand. **Histoire du Pylaisaea radicans Desv. [History of Pylaisia radicans.]** Bull. Soc. Bot. France 66: 99–111. 1919.—The genus Pylaisaea of Desvaux (dating from 1814), with its single species *P. radicans*, has been the cause of much confusion. The author points out the inexact nature of the original description and summarizes the later divergent views regarding the species. From an examination of the type material in the Desvaux Herbarium he is able to prove that a mixture of *Eurhynchium pumilum* (Wils.) Schimp. and *Rhynchostegiella tenella* (Dicks.) Limpr. is present. He expresses the opinion, however, that the species was based primarily on the Eurhynchium and suggests that it be included among

the synonyms of *E. pumilum*, in spite of the fact that Wilson's *Hypnum pumilum* dates from 1849.—*A. W. Evans.*

977. Camus, Fernand. **Le Rhynchostegiella Teesdalei et ses localités françaises.** [**Rhynchostegiella Teesdalei and its French stations.**] Bull. Soc. Bot. France 66: 2–12. 1919.—The author narrates the history of *Rhynchostegiella Teesdalei* (Sm.) Limpr. and describes its distinctive features. It has been confused with *R. curviseta* (Brid.) Limpr. and *R. littorea* (De Not.) Limpr. In France *R. curviseta* is the most widely distributed of the group; the other 2 are confined to the vicinity of the Mediterranean, *R. Teesdalei* in fact being known only from Corsica. Outside France it has been reported from the British Isles and Scandinavia.—*A. W. Evans.*

978. Culmann, P. **Contribution à la flore bryologique du bassin supérieur de l' Alagnon (Cantal).** [**Contribution to the bryological flora of the upper valley of the Alagnon (Cantal).**] Rev. Bryologique 50: 33–48. 1923.—The introductory portion of this paper has already been abstracted [see Bot. Absts. 12, Entry 5759]. In this 2nd instalment the discussion of the hepatics is concluded and that of the mosses begun. Of the 82 species and varieties of hepatics listed *Erimonotus myriocarpus* and *Sphenolobus Hellerianus* are recorded for the 1st time from France, and 4 other species represent additions to the Auvergne flora. Under *Scapania curta* a new var. *arvernica* is proposed. The list of mosses includes 111 species and varieties, 2 of which are new to the Auvergne. Full citations of localities accompany the species listed, and numerous critical notes are interspersed. The following hepatics, although listed, are regarded as doubtfully distinct: *Lophozia heterocolpos, Scapania intermedia,* and *S. paludicola.*—*A. W. Evans.*

979. Culmann, P. **Notes bryologiques sur le Val des Bains (Auvergne).** [**Notes on the bryophytes of the Val des Bains.**] Bull. Soc. Bot. France 66: 156–168. 1919.—During the late summer of 1918 the author explored the Val des Bains in the Auvergne region of central France for bryophytes and bases the present report on his discoveries. He emphasizes the paucity of species and individuals on rotten logs and points out that certain alpine forms occur at much lower altitudes than in Switzerland. His catalogue of species, accompanied by full data regarding stations, includes 99 mosses and 25 hepatics. Of these *Funaria hygrometrica* var. *conica* is proposed as new, while 7 other mosses and 3 hepatics are reported for the 1st time from the Auvergne.—*A. W. Evans.*

980. Loeske, L. **Bryologische Notizen.** [**Bryological notes.**] Herbarium 2: 121–123, 129–132, 145–149, 157–161. 1923.—The author here begins a series of critical notes on various bryophytes. In the 1st note he reduces the genera *Physcomitrella* and *Sporoledra* to synonymy under *Physcomitrium* and *Pleuridium*, respectively. In the 2nd he reduces *Hymenostylium* and *Pleuroweisia* to synonymy under *Gymnostomum* and suggests that the only species of the 2nd genus be known as *G. Schliephackei* (Limpr.), a new combination. In the 3rd he shows that *Leptobarbula* is too close to *Streblotrichum* to be maintained, its only species becoming *S. tenue* (De Not.), another new combination; in the same note he shows that *Dialytrichia* is equally untenable, being at most a subgenus of *Cinclidotus*, and proposes for *D. Brebissonii* (Brid.) Limpr. the new combination *C. mucronatus* (Brid.) Mönkemeyer & Loeske. In the 4th he comments on *Grimmia Doniana* Sm. and its allies. In the 5th he reduces *Tayloria acuminata* Hornsch. to synonymy under *T. splachnoides* (Schleich.) Hook. In the 6th he calls attention to the unstable nature of *Physcomitrium acuminatum* (Schleich.) Brid. and other so-called species induced by dry conditions. In the 7th he corrects a record accrediting *Aulacomnium turgidum* (Wahlenb.) Schwaegr. to the valley of the Sulden in Tyrol, showing that it was based on a specimen of *A. palustre* (L.) Schwaegr. In the 8th he emphasizes the fact that the capsule of *Polytrichum formosum* Hedw. is usually 4-angled, contrary to many published descriptions. In the 9th he records the occurrence of *Tortella inclinata* (Hedw. f.) Limpr. in the vicinity of Berlin and calls attention to the ease with which the tips of the shoots break off, serving doubtless for vegetative reproduction. In the 10th he proves, by means of cultures, that *Drepanocladus Kneiffii* (Schimp.) Warnst. can easily be induced to form orthophyllous shoots under water, while *D. Sendtneri* (Schimp.) Warnst. retains its secund habit; and he recommends the use of culture methods to determine the stability or instability of certain characters. In the 11th he cites

several localities for the rare *Dicranum strictum* Schleich. in northern Germany and tells how it may be recognized in the field. In the 12th he reports the following species from the Bavarian Alps as new to Germany: *Bryum archangelicum* Br. Eur., *Lophozia grandiretis* (Lindb.) Schiffn., *Mnium hymenophylloides* Hüb., and *Odontoschisma Macounii* (Aust.) Underw.; he likewise comments on the habitat of *Anoectangium compactum* Schwaegr. in Baden and shows that the species can bear a small amount of lime. In the 13th he maintains that *Pohlia gracilis* (Schleich.) Lindb. is distinct from *P. commutata* (Schimp.) Lindb. and discusses the gemmae of these and other species of the genus; in this connection he expresses the suspicion that Correns' figure of *P. erecta* Lindb. was based on *P. gracilis*. In the 14th he shows that the suspicion expressed in the 13th regarding a figure by Correns was unfounded. In the 15th he continues the discussion begun in the 12th note concerning the habitat of *Anoectangium compactum* and brings out the fact that the species is apparently more sensitive to lime in some parts of its range than in others. In the 16th he cites *Amblystegium vacillans* Sulliv. for the 1st time from Europe, his record being based on specimens collected by A. Grape in Lapland; he reduces the species, however, to varietal rank and proposes that it be known as *Campylium riparium* (Br. Eur.) Loeske var. *vacillans* (Sulliv.) n. comb. In the 17th he lists some of the more important species distributed by A. Kopsch in the 2nd century of his Bryotheca Saxonica. In the 18th he accredits *Hypnum Lorentzianum* Mol. to Baden and shows that the species is by no means doomed to early extinction, as he had previously feared. In the 19th he refers to Dismier's recent discovery of *Orthotrichum Shawii* Wils. in France [see Bot. Absts. 12, Entry 6485] and gives the distinctive characters of the species. In the 20th he transfers *Barbula papillosissima* Coppey, known at present only from Greece and Sardinia, to the genus *Tortula*, giving it the name *T. papillosissima* (Coppey) n. comb. In the 21st he describes vegetative reproduction by means of deciduous buds in *Campylopus brevipilus* Br. Eur. and *Bryum neodamense* Itzigs. In the 22nd he reviews a recent paper by Evans on the Chilean species of *Riccardia* [see Bot. Absts. 11, Entry 463]. In the 23rd he discusses the habitat of *Archidium phascoides* Brid. at the upper end of Lago Maggiore in Switzerland, quoting freely from a recent work by Jäggli. In the 24th he redescribes the rare *Barbula montenegrina* Breidl. & Szysz. of Montenegro. In the 25th he points out the apparent connection between minute spores and wide distribution in certain mosses. In the 26th he maintains that *Mnium Seligeri* Jur. is distinct from *M. affine* Bl., with which it has been confused. In the 27th he presents evidence that *Dicranum Bonjeani* DeNot. is connected with *D. scoparium* (L.) Hedw. by transitional forms and ought therefore to be considered a synonym. In the 28th he discusses certain *Dicranum* forms with deciduous branches but expresses the opinion that these do not represent true varieties. In the 29th he brings out the distinctions between the bulblets of *Pohlia proligera* Lindb. and those of *P. annotina* var. (or forma) *decipiens* Loeske. In the 30th he takes up the question of *Astomum intermedium* Péterfi, to which Andrews has recently referred [see Bot. Absts. 12, Entry 571], and shows that this species is a synonym of *A. capsulare* (Sm.) Br. Eur. In the 31st he expresses the opinion that *Philonotis fontana* var. *falcata* Brid. was based largely (if not wholly) on material of *P. calcarea* Schimp. In the 32nd he shows that the record for *Grimmia atrata* Miehl. from the Harz Mountains, Germany, is incorrect, being based on a specimen of *Rhacomitrium sudeticum* (Funck) Br. Eur. In the 33rd he points out that *Hypnum reptile* Michx. and *H. pallescens* (Hedw.) Br. Eur. differ in habit, although frequently confused. In the 34th he shows that *Brachythecium Starkei* (Brid.) Lindb. and *B. curtum* Lindb. can not be distinguished by the number of appendages on the cilia of the inner peristome, as maintained by Lindberg, and that there are no transitional forms connecting *B. Starkei* with *B. curtum* or with *B. reflexum* (Starke) Br. Eur., as stated by Limpricht.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

Donald S. Welch, *Assistant Editor*

(See also in this issue Entries 741, 831, 901, 962, 1019, 1020, 1021, 1035, 1038, 1086, 1103, 1105, 1175, 1182, 1189, 1193, 1194, 1220, 1271, 1295, 1309, 1310, 1313, 1314, 1315)

FUNGI

981. Atwood, Alice C. **Bibliographic notes.** Mycologia 15: 103–105. 1923.—Notes are presented on *Hypsilophora* and *Sphaerula.—H. R. Rosen.*

982. Baumgartner, René. **Contribution a l'étude des Laboulbéniales de la Suisse. [A contribution to the study of the Laboulbeniales of Switzerland.]** Jahrb. Phil. Fakultät II. Univ. Bern 3: 257–265. *Pl. 2.* 1923.—Notes are given on the hosts and distribution of these fungi, with a list of the species collected. The following are described as new: *Laboulbenia vulgaris* Peyr. var. *extensa, L. Geodromici, L. Matheyi, L. Rauraciae, L. flagellata* Peyr. var. *procera.—D. S. Welch.*

983. Cavadas, D. S. **Notes sur la "Dartrose" de la pomme de terre et ses consequences. [Black disease of the potato.]** Rev. Path. Veg. et Entomol. Agric. 10: 67–75. *Fig. 1–2.* 1923. —*Vermicularia varians* Duc., cause of the black disease of potato, grows readily on the ordinary culture media forming conidia in the hyphomycete manner. On media of high osmotic concentration conidiophore layers are formed as in *Colletotrichum.* Black sclerotia identical with those found in infested tubers are formed on all culture media and give a distinctive macroscopic appearance. While the sclerotia have not been seen to germinate, they, as well as the chlamydospores, serve to carry the fungus through the winter.—*J. Dufrenoy.*

984. Dodge, B. O. **Origin of the central and ostiolar cavities in pycnidia of certain fungous parasites of fruits.** Jour. Agric. Res. 743–759. *Pl. 1–6.* 1923.—In *Phyllostictina carpogena* the central cavity of the pycnidium results from the gradual disorganization of cells at the center, the cells below them pushing out in their turn. The cells lining the cavity result from the division of cells of the original pseudoparenchyma and from each of these cells 2–3 hyphae or protosporophores branch out which occasionally produce spores. The inward-growing hyphae manifest all stages of disintegration. New buds among the basal cells undergo radial and tangential divisions and thus the basal cells become much smaller than the cells which originally occupied this space in the pycnosclerotium. The hypha-like branches disappear, the cavity is filled with disorganized remains, finally the central and ostiolar cavities contain many spores but no stainable cell remains. This suggests that nutrition for spore formation is obtained from within. The cavity increases in size and the extent of the tissue lining it diminishes.—In the pycnidium of *Sclerotiopsis convava* the spore cavity is surrounded by a heavy wall several cells in thickness, and the young primordia are broad, compact, and mound shaped, the outer portion of which consists largely of hyphae spreading outward from a common base. The apical cells of the hyphae undergo successive divisions. Within the outside border of cells, disorganization occurs in intercalary cells in oriented hyphae. This occurs while expansion is still going on. The cells that are first forced apart in the destruction of tissue and that remain below the region of disorganization are homologues of sporophores. They provide the material which, on swelling, forces the wall farther out and, incidentally, furnish food for the development of spores. Pressure is provided by the swelling of cells freed from the wall above or from the vertical growing hyphae below. This force maintains the even curve of the wall as it lifts the epidermis above. Marginal growth in the cavity contributes to its enlargement. *Sclerotiopsis concava* is therefore about equally lysigenetic and schizogenetic.—In *Schizoparme straminea* the pycnostroma consists of a rather homogeneous plectenchyma of thin-walled cells. The cavity arises as the result of growth and orientation. Rows of vertically placed cells are laid down in a line across the upper central portion of the primordium. The upper cells in

these rows stretch as gelatinization progresses but the cells below the line of final separation continue to grow upward forming a palisade-like row of elongated cells. The elongating cells are the homologues of sporophores although they bear no spores; on disorganizing they furnish substances which play a part in shaping the tissues of the wall. In the disorganization of these cells, potential sporophores arise by the division of cells of the enlarging dome of fertile tissue. The central cavity is thus largely schizogenetic. After central cavity formation has begun, the cells at the top of the young pycnidial knot multiply rapidly forming a cone-shaped tissue. Cells next to the central cavity disorganize and by swelling provide a small space into which adjacent wall-cells bud, turn upward, and converge to form the papillate ostiolar structure. In the meantime by the rapid destruction of the buffer tissue along lines radiating from a point above the ostiole, this cap-like structure is split open in a characteristic fashion.—*E. F. Guba.*

985. Ezekiel, Walter N. **Hydrogen ion concentration and the development of Sclerotinia apothecia.** Science 58: 166. 1923.—The growth of apothecia is inhibited by alkaline media. Slight alkalinity of the soil will probably prevent growth there.—*C. J. Lyon.*

986. Gäuman, Ernst. **Beiträge zu einer Monographie der Gattung Peronospora Corda. [Contributions to a monograph of the genus Peronospora.]** Beitr. Kryptogamenflora Schweiz 5: 1–360. *Fig. 1–166.* 1923.—In this exhaustive treatment of the genus the specific distinctions are based upon shape and size of the conidia. The following species are described as new: *P. campestris, P. vexans, P. Agrostemmatis, P. Melandryi, P. Lychnitis, P. parva, P. vernalis, P. media, P. tornensis, P. atlantica, P. trivialis, P. septentrionalis, P. helvetica, P. Argemones, P. indica, P. alpestris, P. Corydalis intermediae, P. agrorum, P. carniolica, P. hiemalis, P. alpicola, P. illyrica, P. pennsylvanica, P. Ranunculi, P. gigantea, P. Anthemidis, P. sulfurea, P. danica, P. Tanaceti, P. Artemisiae biennis, P. rossica, P. Teucrii, P. flava, P. Verbasci, P. Digitalidis, P. canadensis, P. Lithospermi, P. Omphalodis, P. Symphyti, P. Coronillae, P. Lathyri palustris, P. Orobi, P. Lentis, P. Ornithopi, P. Oxytropidis, P. Phacae, P. Tetragonolobi, P. Trifolii alpestris, P. Trifolii hybridi, P. Trifolii minoris, P. Trigonellae, P. narbonensis, P. Mayorii, P. Viciae sativae, P. sepium, P. Ruegeriae, P Lagerheimii, P. muralis, P. bohemica, P. Monolepidis, P. Amaranthi, P. insubrica, P. Rubiae, P. rhaetica, P. norwegica, P. Cochleariae, P. Potentillae reptantis, P. Potentillae sterilis, P. Sanguisorbae.*—*D. S. Welch.*

987. Murrill, W. A. **Sullivant's Ohio fungi.** Mycologia 15: 150–151. 1923.—Notes made by the writer on 7 Agaricicales in Montagne's herbarium (Paris) are presented. They represent specimens collected in Ohio by Sullivant.—*H. R. Rosen.*

988. Russ, Charles. **A skin eruption due to a mould.** Lancet 204^{5135}: 77–78. 1923.—Eruptions occurred on the forearms of a group who were sorting and packing dried foods. A fungus was isolated which proved to be pathogenic. A description of the fungus is given. G. Massee, to whom a pure culture was submitted, found it to be an undescribed Cercosporella, suggesting the name *C. vexans.* E. G. Graham Little diagnosed the disease as ringworm.—*W. H. Tisdale.*

989. Shear, C. L. **Life histories and undescribed genera and species of fungi.** Mycologia 15: 120–131. *Pl. 12–13, fig. 1–7.* 1923.—**Schizoparme** is described as a new genus with *S. straminea* as a new species. In the perithecial form this "seems related to some of the species described under *Physalospora.*" "The pycnidia resemble *Coniothyrium diplodiella.*" The fungus in its pycnidial form is found on strawberries and in one or both stages on dead leaves of *Rosa, Fragaria, Castanea, Prunus, Quercus, Rhus, Rubus, Salix, Vitis,* and *Eucalyptus.* A fungus obtained in poured plates of *Pilacre Petersii* is referred to the new genus **Eragosphaeria**; it is closely related to such genera as *Pleuroascus, Magnusia,* and *Arachnomyces.* Based on *Hypoxylon Petersii* B. & C. the new genus **Peridoxylon** is erected. "Aside from its dark-colored, nonseptate spores, this fungus bears little resemblance to *Hypoxylon,* and is evidently not congeneric with the other species of that genus." The following genera are more or less related to *Peridoxylon: Galziella, Sarcoxylon, Penzigia, Thuemanella, Engleromyces, Entonaema,* and *Xylocera.* A fungus found on old dead dewberry vines and causing a rot of dewberries grown in North Carolina is named *Phyllostictina carpogena* sp. nov. It closely resembles the pycnidial form of *Guignardia Bidwelli.* The author rejects the names *Phoma* and *Phyllosticta* because they "have been applied to such a large number of miscellaneous and heterogeneous pycnial forms that they have lost all definite taxonomic significance."—*H. R. Rosen.*

990. Thurston, H. W., Jr. **Intermingling gametophytic and sporophytic mycelium in Gymnosporangium bermudianum.** Bot. Gaz. 75: 225–248. *Pl. 12–13, fig. 1–4.* 1923.—Material of this autoecious species from Mississippi, Florida, and Bermuda was studied. Bonin's fixing solution gave the best results. In embedding in paraffin the material was left in the oven 3–4 weeks. Fleming's triple stain and fuchsin and iodine green gave satisfactory differentiation of mycelia. Aecidiospores were successfully germinated in tap water, the process being completed in 2–4 hours. In telcutospores the basal cell usually germinated first. Attempts to inoculate *Juniperus barbadense* (6–18 inch high trees) with viable aecidiosopores and basidiospores failed. The author believes that galls of this species originate from infection of the axillary bud, the leaf and stem tissue later becoming involved. Secondary growth or a proliferation is reported springing from the base of the old gall, presumably from stem mycelium which has survived an unfavorable growth period. Only binucleate or sporophytic mycelium has been formed in these proliferations. The aecidia appear to differentiate early and grow with the gall, always arising from uninucleated mycelium. The binucleate mycelium arises in the usual manner by fusion of 2 gametophoric hyphae. The author thinks the gametophoric mycelium to be shorter lived than the sporophytic, which after the death of the former produces the teleutosori. From 1 to 4 of the latter are produced on a single gall, often immediately adjoining an aecidium cup. The sporophytic hyphae have a noticeably greater diameter than the gametophytic ones. Numerous haustoria from both kinds of hyphae were found to be uninucleate. An appresorium is formed preceding the development of the haustorium proper. The latter organ does not penetrate the host cell plasma membrane. Phylogenetically the author believes this rust to be a "reduced specialized species which has learned to live on a single host, without, however, having lost any spore forms except spermatia." Regarding the problem of the presence of the 2 mycelia in the same gall, the writer adopts the theory of dual infection.—*B. W. Wells.*

991. Vincens, F. **Observations sur le Sclerotium Orizae faites in Cochinchine [S. Orizae in Cochinchina].** Rev. Path. Veg. et Entomol. Agric. 10: 112–131. *Fig. 1–7.* 1923.—A disease of rice plants caused by *Sclerotium Orizae* is termed by the growers in Cochinchina "trem-lùa." The fungus is found only with difficulty on diseased plants in the field. The sclerotia apparently develop spores in dry soil in the summer. Experiments show that the host becomes diseased when grown in soil which contained sclerotia the preceding year. The fungus grows readily in various culture media. In culture many forms of fungi developed but none were shown to be connected with the sclerotia. From dried sclerotia placed in moist conditions 2 *Verticillium*-like fungi developed. These are described as *Beauveria Oryzae* n. sp. alpha and beta and were found to attack rice seedlings. A Fusarium (*F. Orizae* beta n. sp.) is sometimes associated with them. Another *Fusarium* (*F. Orizae* alpha) was found to hinder their formation on some culture media.—*J. Dufrénoy.*

992. Vizioli, José. **Some Pyrenomycetes of Bermuda.** Mycologia 15: 107–119. *Pl. 10–11.* 1923.—Notes are given on 4 species in as many genera of Hypocreales, and 12 more or less unrelated species of Sphaeriales. Of the later the following species are described as new: *Anthostomella Rhizophorae, Eutypella linearis,* and *Endothia Coccolobii.*—*H. R. Rosen.*

LICHENS

993. Du Rietz, G. Einar. **Lichenologiska fragment. V. Några för Sverige nya eller föga Kända lavarter. [Lichenological fragments. V. Some new or little known lichens in Sweden.]** Svensk. Bot. Tidskr. 17: 83–95. 1923.—Critical studies are made on and new localities in Sweden reported for *Alectoria cincinnata* (Fr.) Sern., *Rinodina colobina* (Ach.) Th. Fr., *Physcia elaeina* (Sm.) A. L. Sm., *Leptogium byssinum* (Hoffm.?) Nyl., *Micarea turfosa* (Mass.) D. R., and for the following new forms and combinations: *Leptogium byssinum* (Hoffm.?) Nyl. f. *obscurum,* f. *amphineum* (*Leptogium amphineum* Ach. mscr., Nyl.) and f. *coronatum* (*L. byssinum* Nyl. sens. strict.), and *Pertusaria carneonivea* (*Gyalolechia carneonivea* Anzi.) *Alectoria cincinnata* is an alpine species also known from the Åland Islands and now found by the author on an island outside of Stockholm. It illustrates well that many alpine plants prefer seashores when occurring in more southern regions.—*O. Heilborn.*

BACTERIA

994. Coleman, George E. **The distribution of spores of B. botulinus in the soil of a restricted area in California III.** Jour. Infect. Diseases 31: 556–558. 1922.—*B. botulinus* type *a* and *B. tetani* were found in cultivated and virgin soils in and near Santa Barbara.—*R. L. Starkey.*

995. Gardner, Max W., and James B. Kendrick. Bacterial spot of tomato and pepper. Phytopathology 13: 307–315. *Pl. 14.* 1923.—*Bacterium vesicatorium* Doidge, *Bacterium exitiosum* Gardner & Kendrick, and the organism causing the bacterial spot of pepper (*Capsicum annuum* L.) were compared as to their physiological reactions. The 3 agree essentially in all reactions and are considered identical. On grounds of priority the organism should be known as *Bacterium vesicatorium* Doidge. Further successful inoculations are reported on *Solanum nigrum* L., *S. dulcamara* L., *S. rostratum* Dunal, *Physalis minima, Datura tatula, Nicotiana rustica* L., *Lycopersicum pimpinellifolium* Dunal, *Lycium halimifolium* Mill., *L. chinensis* Mill., *Hyoscyamus aureus* L., and *H. niger* L. Results of numerous field inoculations indicate that infection occurs on unwounded tomato (*Lycopersicum esculentum*) fruits, but only while they are very young—less than 2½ cm. in diameter.—*B. B. Higgins.*

996. Henrici, Arthur T. **A statistical study of the form and growth of a diphtheroid bacillus.** Proc. Soc. Exp. Biol. and Med. 20: 179–180. 1922.—A chromogenic diphtheroid bacillus was isolated from lake water and found to have the reverse properties of *B. megatherium* in respect to variation in size.—*M. M. Brooks.*

997. Inman, O. L. **Iron-depositing bacteria.** Science 58: 13. 1923.—The writer finds *Spirophyllum ferrugineum* Ellis, *Gallionella ferruginea* Ehrenberg, and *Leptothrix ochracea* Kützing or *Chlamydothrix ochracea* Migula in natural chalybeate waters near Yellow Springs, Ohio.—*C. J. Lyon.*

998. Mellon, Ralph R. **Observation on the origin of biotypes (microbic dissociation) in pure lines of bacteria.** Proc. Soc. Exp. Biol. and Med. 20: 191. 1922.—The experiments reported show that bacterial variability can be identified with pleomorphic cycle. Pleomorphism is regarded as a true life cycle and in reality represents variation.—*M. M. Brooks.*

999. Mellon, Ralph R. **Observations on the relation of bacterial giant coccoids to zygospore formation.** Proc. Soc. Exp. Biol. and Med. 20: 192. 1922.—Giant coccoids have been shown to be the precursors of a diplococcus mutant. Their viability is much greater than that of the bacillary form. In certain environments a spiral reorganization occurred to form a zygospore.—*M. M. Brooks.*

1000. Peterson, Emelia, and Ivan C. Hall. **The isolation of Bacillus histolyticus from soil in California.** Proc. Soc. Exp. Biol. and Med. 20: 502–503. 1923.—The organism as isolated from soil is described together with the method of isolation.—*M. M. Brooks.*

1001. Schoenholz, P., and K. F. Meyer. **The occurrence of the spores of B. botulinus in the Hawaiian Islands and China. VII.** Jour. Infect. Diseases 31: 610–612. 1922.—*B. botulinus* was identified in 17.9 per cent of the soil and vegetable samples collected in the Hawaiian Islands and in 26.9 per cent of the soil samples procured from 2 coast provinces in China. Type A was found in only 3 instances. These observations further emphasize the fact that the soils of the New World and particularly of the Cordilleran Mountain system of North America harbor type A, while countries with old civilizations as China and Europe and some of the Atlantic and Middle Western states of America contain type B either exclusively or at least predominantly.—*R. L. Starkey.*

1002. Tunnicliff, Ruth. **The life cycle of Bacillus fusiformis.** Jour. Infect. Diseases 33: 147–154. *Pl. 1.* 1923.—That fusiform bacilli and spirilla appear in the life cycle of *Bacillus fusiformis* is indicated. The organism is an obligate anaerobe. It became markedly pleomorphic in different media and appeared as short and long rods showing deeply stained bodies as well as nonmotile threads and filaments made up of or enclosing short bacillus-shaped bodies. Later in growth, spiral forms appeared. The spirilla appeared to develop from the bodies contained in the threads after these bodies dropped out of the filaments, or they developed directly in the threads. In the latter case they emerged from the ends of the threads or were set free after the disappearance of the thread. Masses occurred, similar to the symplastic stage of Löhnis, generating bacilli and threads.—*R. L. Starkey.*

MYXOMYCETES

1003. Heitzmanówna, Wanda. **Z życia plywek i myksameb Makulca Makówki (Didymium nigripes Fr.).** [Some observations on the zoospores and myxamoebae of Didymium nigripes.] Bull. Soc. Polonaise Nat. 47: 531–537. *Fig. 32.* 1922.—The swarmspores and myxamoebae of this slime mould are positively chemoactic toward starch grains from wheat. The starch grains are broken into minute bits and consumed. The spore of this species germinates in 3 ways under identical conditions: (a) by 1 swarmspore, (b) by several swarmspores, (c) by a non-ciliated globose plasma mass which after dividing forms 2 swarmspores.—*H. M. Fitzpatrick.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 761, 901, 1267)

1004. Berry, Edward W. **Tree ancestors. A glimpse into the past.** *270 p., 48 fig.* Williams & Wilkins Co.: Baltimore, 1923.—This is a popular account of the geological history of the sequoia, bald cypress, walnuts, hickories, willows, poplars, birches, hazels, hornbeams, alders, beeches, oaks, chestnuts, elms, hackberries, sycamores, magnolias, tulip trees, gums, witch hazels, locusts, redbuds, sumachs, hollys, maples, ashes, lindens, dogwoods, sassafras, and persimmons.—*E. W. Berry.*

1005. Foerste, A. F. **A Stigmarian root from the Chester formation of Illinois.** Denison Univ. Bull. 23[4]: 116–120. *Pl. 12–13, fig. 12.* 1923.—The author describes *Dictyophlois reticulata illinoisensis*, a stellate type of Lepidophyte rhizophore that is apparently confined to the period of Lower Carboniferous time represented by the Chester formation.—*E. W. Berry.*

1006. Frentzen, K. **Beiträge zur Kenntnis der fossilen Flora des südwestlichen Deutschland.** [Contribution to fossil flora of southwest Germany.] Jahresb. & Mitt. Oberrhein. Geol. Ver. 12: 1–15. *Fig. 1–4.* 1923.—The petrified wood of *Dadoxylon Leiningeri* n. sp. is described from the lower Muschelkalk (middle Triassic) of Kraichgaues in Baden, and the zonal formation of woods of the Dadoxylon type is discussed.—*E. W. Berry.*

1007. Jessen, Knud, og R. Rasmussen. **Et Profil Gennem en Tørvemose paa Faerørne.** [Section of a bog in the Faroe Islands.] Danmarks Geol. Unders. 1[13]: 1–32. 1922.—Over 20 vascular plants, 19 mosses, and 10 algae found in bog at Thorshavn are listed. Of these *Hippuris vulgaris* does not now exist on the Islands. Pollen of *Alnus, Betula, Corylus, Pinus,* and *Tilia* found in the bog is considered to have been brought by the wind from Scotland, Norway, and Iceland. The age is considered as probably upper Turbarian i.e., post glacial with a somewhat warmer climate than at present.—*E. W. Berry.*

1008. Laurent, L. **À propos d'une empreinte végétale des couches éocènes d l'Escarene près Nice.** [On a leaf impression from the Eocene of Escarene near Nice.] Comp. Rend. Congrés Soc. Savantes en 1922. *75–79. 1 pl.* 1923.—A leaf of *Apocynophyllum nicoeense* n. sp. is described from the supposed Auversian stage of the Eocene near Nice.—*E. W. Berry.*

1009. Laurent, L. **La feuille envisagée comme base d'une methode de reconnaissance des végétaux.** [The leaf as a means of identification of plants.] Compt. Rend. Congrès Soc. Savantes en 1922. *59–64.* 1923.—The determination of leaves of trees by means of form, texture, and venation is discussed.—*E. W. Berry.*

1010. Norin, E. **The continental clay sediments and their plant-bearing beds.** Bull. Geol. Surv. China 4: 50–51. 1922.—The author enumerates the horizons of the plant-bearing beds in the province of Shansi, China, mentioning a few of the plants found.—*E. W. Berry.*

1011. Pascoe, E. H. **General report for 1922.** Rec. Geol. Surv. India 55: 34. 1923.—*Cladophlebis denticulata, Ginkgoites digitata, Pagiophyllum divaricatum, Brachyphyllum expansum, Podozamites distans,* and *Ptilophyllum* cf. *hislopi* are recorded from the Upper Gondwana coal measures (Rhaetic or Jurassic) of the southern Loi-an Shan states.—*E. W Berry.*

1012. Schwarz, H., und G. Laupper. **Von der Heukohle zur Naturkohle.** [From hay charcoal to mineral coal.] Viertel Jahrsschr. Naturf. Ges. Zürich 67: 268–371. 1922.—A critical study is reported of the genesis of coal beginning with the charcoal produced in a burning hay stack and passing through the various grades to the typical mineral coal in the rock strata.

Laupper and others before him had suggested that there might be a certain parallelism between the development of coal in a burning hay stack and the formation of mineral coal in nature. The process of coal formation is considered under the following heads: (1) as a fermentation process; (2) as a humification process; (3) as a carbonization process (Inkohlungsprocess); (4) as a distillation process; and (5) spontaneous combustion in the process of coal formation.—*John H. Schaffner.*

1013. Scott, D. H. **A correction.** Bot. Gaz. 75: 211. 1923.—Referring to a paper by Eda M. Round [see Bot. Absts. 12, Entry 2843] the author states that there was no contention on his part in his statement: "In all cases where fructifications have been referred to *Annularia* or *Asterophyllites*, they have so far proved to be of the *Calamostachys* type." He believes Miss Round to have quoted him "inaccurately so as to convey the wrong impression."—*B. W. Wells.*

1014. Seward, A. C., and J. Walton. **On a collection of fossil plants from the Falkland Islands.** Quart. Jour. Geol. Soc. London 79: 313–333. *Pl. 19–22.* 1923.—The authors confirm the presence of Devonian plants in the Falklands discovered by the Swedish South Polar Expedition of 1901–1902 and describe indefinite impressions of Lepidodendroid stems from these rocks, which they are inclined to think are Middle Devonian in age. The bulk of the paper is devoted to the Permo-Carboniferous plants. These include Equisetaceous stems, probably *Phyllotheca* and *Neocalamites*, several species of *Glossopteris*, and petrified wood described as *Dadoxylon Bakeri* n. sp.—*E. W. Berry.*

1015. Turner, H. G., and H. R. Randall. **A preliminary report on the microscopy of anthracite coal.** Jour. Geol. 31: 306–313. 1923.—This preliminary report is largely devoted to a description of a new method for obtaining specimens of anthracite for study with the metallographic microscope. The outline of the method is to polish surfaces of a small block, heat in a drying oven to remove moisture, and then oxidize with blowpipe or blast lamp. Remarkable results are obtained up to 1,000 diameters and the authors figure various specimens they have treated showing spore exines, cellular structures, wood fibers, etc.—*E. W. Berry.*

1016. Walton, J. **On Rhexoxylon, Bancroft—a Triassic genus of plants exhibiting a liane-type of vascular organisation.** Phil. Trans. Roy. Soc. London B 212: 79–109. *Pl. 5–6.* 1923.—A new species, *Rhexoxylon tetrapteridoides*, is described and named. It was found in the Molteno Beds of the Stormberg Series in Cape Province, South Africa. Some specimens of *R. africanum* Bancroft are described, and the original diagnosis of the species is emended. A method of examining very transparent silicified wood is described. These species are compared with *Antarcticoxylon priestleyi* Seward, and reasons given for referring the latter to the genus *Rhexoxylon*, the diagnosis of the genus being modified so as to include this species. The vascular organisation of *Rhexoxylon* differs from anything found in the Medulloseae, but its secondary tissues somewhat resemble those of modern lianes; the adult structure of *Rhexoxylon* is formed in a manner unlike that of any other known fossil plants. There are many connections between the genus and certain Dadoxyla of the Gondwana Province. The geological significance of the generic identity of *Antarcticoxylon* and *Rhexoxylon* is discussed.—*W. R. G. Atkins.*

PATHOLOGY

Frederick V. Rand, *Editor*
Lillian C. Cash, *Assistant Editor*
Harry Braun, *Assistant Editor*

(See also in this issue Entries 630, 635, 646, 647, 655, 684, 703, 729, 753, 780, 794, 821, 822, 826, 845, 850, 880, 891, 892, 911, 917, 924, 927, 959, 971, 983, 984, 985, 988, 989, 990, 991, 995, 1099, 1100, 1111, 1120, 1133, 1153, 1157, 1193, 1194, 1195, 1196, 1206, 1214, 1215, 1216, 1217, 1219, 1220, 1227, 1336, 1337, 1338, 1339)

DISEASES CAUSED BY FUNGI

1017. Baribeau, B. **Fletrissure et pourriture de la tige du tournesol dans la province de Québec.** [**Sunflower wilt in the province of Quebec.**] Sci. Agric. 3: 397–400. *6 fig.* 1923.—*Sclerotinia libertiana* is described as the cause of sunflower wilt. The writer gives the results

of cultural work on overwintering and longevity of the sclerotia, artificial cultures, and inoculation experiments with carrots, onions, and turnips. Carrots are most readily attacked by the organism. Crop rotation and destruction of diseased plants are given as the chief means of control.—*T. G. Major.*

1018. Blaringhem, L. **Notes sur la biologie des rouilles et des charbons.** [Biological notes on rusts and smuts.] Rev. Path. Vég. et Entomol. Agric. 10: 172–182. 1923.—Normal green plants of *Lavatera arborea* L. are far less heavily rusted by *Puccinia Malvacearum* Mont. than are "mosaic" plants of the same species. On mosaic plants sori are far more numerous on white or yellow areas than on chlorophyll areas.—*J. Dufrenoy.*

1019. Burkholder, Walter H. **The gamma strain of Colletotrichum lindemuthianum (Sacc. et Magn.) B. et C.** Phytopathology 13: 316–323. 1923.—In a previous work Barrus separated *Colletotrichum lindemuthianum* into alpha and beta strains on the basis of susceptibility or resistance of certain varieties of beans to them. He found a few varieties resistant to both strains. Later, 1 of these, the White Imperial variety, was found infected with *Colletotrichum.* The writer isolated this fungus and made extensive inoculations on 60 varieties of beans to determine the relation of this form to the alpha and beta strains. It agreed most nearly with the beta strain. Further inoculations showed that 2 varieties resistant to the beta strain were susceptible to the new strain, and that 1 variety slightly susceptible to the beta strain was resistant to the new strain. From this the conclusion is drawn that the fungus is a new strain distinct from the alpha and beta strains, and it is designated as the gamma strain. It seems probable that this gamma strain arose as a mutation from the beta strain. Hybridization experiments between a variety susceptible and one resistant to the new strain showed resistance to be dominant.—*Adeline Ames.*

1020. Cavadas, D. **Sur la biologie de Vermicularia varians Ducomet.** [The biology of V. varians.] Rev. Path. Vég. et Entomol. Agric. 10: 138–140. 1923.—Inoculations on potato plants 1½ months old, with and without wounding, were followed by symptoms similar to those of Crépin's "enroulement flasque" but not related to Quanjer's leafroll or leptonecrosis; wilting finally occurred and fructifications of the fungus appeared on the stem. These symptoms also appeared on plants grown in infected soil or from diseased tubers; seedling infection takes place before sufficient woody tissue is developed, resulting in wilting and death. Inoculations on plants over 1½ months old produced localized infection only, with comparatively little general injury; no infection on such older plants occurred without preliminary wounding. The fungus fruits 2 months after successful inoculation on older plants but only after 4 months on the more severely infected plants inoculated when young.—*Harry Braun.*

1021. Ciferri, R. **Ulteriori note sulla "carie" del pomodoro.** [A further note on the decay of tomatoes.] Rev. Patol. Veg. 13: 33–36. 1923.—The tomato fruit rot previously described as caused by a Phoma to which the name *Phoma Ferrarisii* was tentatively given is now recognized as identical with the tomato fruit rot described by Clara O. Jamieson as caused by *Phoma destructiva* Plowright emend. Jamieson.—*F. M. Blodgett.*

1022. Crépin, Ch. **Dartrose (Vermicularia varians Ducomet) et Gale argentée (Spondylocladium atrovirens Harz) du turbercule [sic] de pomme de terre.** [French potato scab or black disease, and dry scab or silver scurf of tubers of the Irish potato.] Rev. Path. Vég. et Entomol. Agric. 10: 63–66. *2 fig.* 1923.—*Vermicularia varians* forms black dense sclerotia filling infected cells and appearing as black spots, sharply limited on the tuber skin. *Spondylocladium atrovirens* forms only small mycelial aggregates, leaving infected cells mostly empty. Affected spots, therefore, appear silvery gray in color.—*J. Dufrenoy.*

1023. Fraser, W. P., and P. M. Simmonds. **Co-operative experiments with copper carbonate dust and other substances for smut control.** Sci. Agric. 3: 297–302. 1923.—Experimental results showed copper carbonate to be the most effective of the dusts tested for smut control. Mixing with Fuller's earth, lime, etc., reduced its effectiveness. Formaldehyde dipping gave perfect control and the effect on germination was not enough to influence yield. The gas treatment in which paraformaldehyde is heated and the gas pumped into a box of wheat is unsatisfactory. The dust treatment is recommended for light infections, the formaldehyde dip for heavily infected seed.—*Frederick V. Rand.*

1024. Friederichs, K. I—Verslag van den Entomoloog over het tijdvak January 1, 1922 tot December 31, 1922. [I—Report from the Entomologist for 1922.] II—Verdere mededeelingen omtrent de schimmel Botrytis stephanoderis. [II—Further contributions regarding the fungus Botrytis stephanoderis.] III—Ontsmetting van aangeboorde koffiebessen met kokend water of stoom. [III—Treatment of the attacked berries by boiling water or steam.] Mededeel. Koffiebessenboeboek-Fonds No. 7. *149–174.* 1923.—I. In this report investigations are mentioned regarding "koffieboeboek" (Stephanoderes coffeae?). Mention is made of a fungus (Botrytis stephanoderis) which is parasitic on the insect and of an ichneumon-fly present in Uganda, which attacks the boeboek. Studies are made of susceptibility of different varieties and whether the generations of the boeboek follow one another with the same rapidity in certain varieties as in others. Control measures are: 1—picking of berries as early as practicable, 2—picking of fallen berries from the soil, 3—spraying of the berries with a mixture of 6 parts wagon grease and 1 part petroleum, 4—treatment of the crop with hot water or steam.—II—Five infection experiments were made with the fungus, *Botrytis stephanoderis.* Spores in suspension were sprayed over the berries. In no case was increased attack of the fungus on the boeboek observed. Control experiments were made. In 2 of the experiments the attacked berries fallen on the ground were buried and sprayed with a suspension of spores, after which they were covered with soil.—In places where the berries became too ripe (lack of pickers), or where the planting of the trees was too close, the beetles greatly increased, and likewise the fungus, attacking about 67 per cent of the beetles in contrast to 5 to 10 per cent in other years. —Control of the beetles by artificial cultivation of the fungus is impracticable because of the high costs.—III—Plantations and parts of plantations nearest receiving stations are most heavily attacked. To prevent the escape of the beetles from the berries delivered, trials were made with steam treatment in tin cans or by dipping the sacks with berries in boiling water for a few minutes. In one plantation treatment was given by dipping perforated pails filled with berries in boiling water leaving each pail about 1½ minutes under water. For badly attacked lots it is advisable to dip them while in the picking sacks; 2½ to 3 minutes is sufficient.—It was found that boeboek was killed after 1½ minutes in hot water. Boebock in berries in small bags were killed after 15 seconds.—An anonymous paper giving the changes in indemnifications for attacked coffee berries is attached (pp. 165–168). Where the indemnification used to be: below 5 per cent damage, no repayment, from 5–10 per cent damage, 2½ per cent repayment and graduating to 50 per cent damage with 2½ per cent repayment for each 5 per cent of damage increase; it has been changed to 1½ per cent for 5 to 10 per cent damage, with an increase of 1 per cent for each additional 5 per cent damage. Coffee berries with damage greater than 50 per cent are undeliverable.—A review of literature regarding boeboek is appended, (pp. 169–171), as is a letter from H. Hargreaves regarding the insect parasitic on boeboek in Uganda. It is probable that it belongs to the Proctotrupidae.—*Peter J. Klaphaak.*

1025. Gard, M. **L'Armillaria (Armillariella Karst) melea [sic] Vahl. et le Pourridié du noyer.** [A. mellea and root-rot of Juglans in France.] Rev. Path. Vég. et Entomol. Agric. 10: 55–62. *6 fig.* 1923.—The relation of mycelial threads and rhizomorphs in roots of *Juglans* to carpophores of *A. mellea* is described. Roots of various trees left in the soil of nurseries after they have been severed from transplanted trees are reported to live for many years unless they become infected by *A. mellea.*—*J. Dufrenoy.*

1026. Hammond, A. A. **Spraying experiments for brown rot of stone fruits (Sclerotinia fructigena).** Jour. Dept. Agric. Victoria 20: 182-189. 1922.—The results of tests with different sprays on different varieties of fruits are reported.—*Wm. E. Lawrence.*

1027. Heald, F. D., and L. W. Boyle. **Further notes on the relation of the spore load to the per cent of stinking smut appearing in the crop.** Phytopathology 13: 334-337. 1923.—Tests were made on 6 varieties of wheat. Seed were smutted to carry amounts of smut varying from 0.005 to 3 gm. per 100 gm. of seed. The seed were then planted under uniform conditions, and plant and head counts were made at harvest time to determine the per cent of smut. The results showed a gradual reduction in the per cent of smutted plants with diminished spore load. Seed with spore load barely sufficient to be visible to the unaided eye produced a very low per cent of smutted plants, 0.0–6.9 per cent. For spring planting it will apparently not be profitable to treat seed on which smut spores are not visible.—*Adeline Ames.*

1028. Kelsall, A. **Experiments on the dust method of smut control.** Sci. Agric. 3: 303–307. 1923.—The present work seems to indicate that the dust method is not advisable where absolute control is desired. For such varieties as Liberty oats, which are highly susceptible to formalin injury, dust may be advantageously used. Copper carbonate at the rate of 4 ounces per bushel and sulphur at 8 ounces per bushel is recommended.—*T. G. Major.*

1029. Laidlaw, W., and C. C. Brittlebank. **Brown rot of stone fruits: (Sclerotinia cinerea (Bon.) Schr., Monilia).** Jour. Dept. Agric. Victoria 20: 442–443. 1922.—After destroying the mummies and diseased twigs, the results of 1 season's experimental spraying showed that commercial lime sulphur was most effective in controlling brown rot on peaches. Copper sulphate and copper acetate were least effective.—*Wm. E. Lawrence.*

1030. Lipscomb, G. F., and G. L. Corley. **On the vitality of cotton seed.** Science 57: 741–742. 1923.—Cotton seed infected with anthracnose (*Colletotrichum Gossypii* Southw.) may be sterilized by first drying and then heating to the boiling point of water for a short time in a dry, inert atmosphere. The percentage of germination is increased over that of the untreated seed.—*C. J. Lyon.*

1031. M. **Zur Bekämpfung des Kartoffelkrebses.** [Control of potato wart.] Wiener Landw. Zeitg. 73: 225–226. 1923.—This is a discussion of plans for increasing the stocks of the 8 German potato varieties which are immune to wart so that the 20,000 or more hectares of infested ground in Germany and infested areas in Poland and Czechoslovakia may be planted to immune sorts.—*F. Weiss.*

1032. McRae, W. **I. History of the operations against budrot of palms in South India. II. Inoculation experiments with Phytophthora palmivora Butl. on Borassus flabellifer Linn. and Cocos nucifera Linn.** Mem. Dept. Agric. India Bot. Ser. 12: 21–70. *2 pl.* 1923.—I. These operations against budrot of palms, which consist in cutting out dead trees and removing the top in infected trees, were initiated in 1906 and the cost from 1906 to 1921 has been about 3 lakhs of rupees. The benefits of the operations may be stated as follows: (a) the value of the palms that have been cured is 417,000 rupees; (b) if the disease had continued at its initial intensity 1,500,000 palms would have died instead of 758,000. The value of the 742,000 trees saved is about Rs. 1,484,000. (c) The disease has been reduced from a great menace (100,000 in 1908) to a controllable factor (8,700 in 1921). It is suggested that it became epidemic only after the great irrigation scheme of 1854 had changed the delta into double crop wet land. It is pointed out that, if this is true, the palmyra palm is doomed in the deltas. The disease has recently been recorded from Bengal. It also occurs on the coconut palm (*Cocos nucifera* L.) Apparently the disease is spread by the knives of the tappers, by the rhinoceros beetle (*Oryctes rhinocerus* L.), by rain splashing on the expanding infected leaves, and by human agencies.—II. A large number of experiments are described which confirm and amplify the observations of previous workers (Butler, Shaw, Sundararaman), definitely showing that *Phytophthora palmivora* will lead to the death of both the palmyra and the coconut palm, that it can pass from one to the other palm and that all the symptoms of budrot have been reproduced in both palms as a result of infection by this fungus. It is claimed that the fungus is the primary cause of the rot of the crown and the controlling factor in the epidemic form in South India. The author considers that these results completely meet the criticism of Sharples and Lambourne (Ann. Bot. 36: 64–69. 1922) regarding the cause of budrot of palms in India.—*A. Howard.*

1033. Mann, Harold H., and S. D. Nagpurkar. **Further investigations on the Fusarium blights of potatoes in Western India.** Agric. Jour. India 17: 564–576. 1922.—High temperature, whether in the field or in the store, was found to be very favorable to the attack by Fusarium. Direct infection of tubers with unbroken skin is uncommon but infection takes place readily if the skin is removed or if the potatoes are attacked by the potato moth (*Phthorimaea operculella*). Tubers, slightly attacked by *Fusarium*, germinate more readily than sound seed and for this reason are sometimes preferred by the cultivators of the Deccan. Infected sets, however, were found to produce diseased potatoes in over 70 per cent of the cases. Soil mixed with diseased tubers produced diseased potatoes in 53 per cent of cases. It was found, however, that after 9 months the soil ceased to be infective. Early harvesting proved advisable in crops affected by *Fusarium* as the loss in storage increases rapidly if the plants are allowed to ripen in the field.—*A. Howard.*

1034. Miège, M. **Sur une maladie du collet des céréales.** [A foot-rot disease of cereals.] Rev. Path. Vég. et Entomol. Agric. 10: 53–54. 1923.—Wheat stems in Casablanca (Morocco) were destroyed at the foot by a fungus, probably *Fusarium culmorum.*—*J. Dufrenoy.*

1035. Mitra, M. **Helminthosporium spp. on cereals and sugarcane in India. Part I. Diseases of Zea mays and Sorghum vulgare caused by species of Helminthosporium.** Mem. Dept. Agric. India Bot. Ser. 11: 219–242. *3 pl.* 1923.—Species of *Helminthosporium* occur in India on almost all cereal sand on sugarcane. *H. turcicum* Pass. occurs on maize only in Bihar and on *jowar* (*Sorghum vulgare*) only in the Punjab. These 2 strains are morphologically alike but show some difference in culture. Cross inoculation experiments show that both strains can infect maize, *jowar,* wheat, barley, oats, and sugarcane. The author believes these to be 2 different strains. *H. turcicum* is the cause of an important disease of maize in Bihar. Infection takes place either through a stoma or by piercing the cuticle. It can be grown on a large number of media but the perfect stage of this fungus has not been observed on any medium. The fungus prefers a reaction of 0 to + 5 Fuller's scale.—*A. Howard.*

1036. Munerati, O. **Le basse temperature al momento della germinazione fanno sfuggire il grano all'attaco della carie?** [Does low temperature at the time of germination enable wheat to escape bunt?] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 32[1]: 285–289. 1923.—Wheat seed heavily contaminated with spores of *Tilletia* were planted (to be allowed to germinate) under a range of temperature conditions. Those germinated at 2–4 and 22–25°C. were free or nearly free of bunt while those germinating at 10–12°C. were heavily infested.—*F. M. Blodgett.*

1037. Perret, Cl. **Flétrissement des pieds et filosité de la pomme de terre.** [Stem disease and spindling sprout of potato.] Rev. Path. Vég. et Entomol. Agric. 10: 168–171. 1923.—Tubers obtained in potato fields of central France from plants that wilted (due to *Vermicularia varians?*) early in the summer of 1922 were for the most part unable to grow vigorous shoots when seeded in 1923. Tubers obtained from fields at the higher altitudes proved to be the best for seed.—*J. Dufrenoy.*

1038. Sundararaman, S. **A new ginger disease in Godavari District.** Mem. Dept. Agric. India Bot. Ser. 11: 209–217. *4 pl. (1 and 3 col.)* 1922.—The leaf disease of ginger (*Zingiber officinale*) is shown to be due to a fungus for which the name *Vermicularia Zingibereae* n. sp. is suggested. While inoculations with this new species of *Vermicularia* produced the disease on ginger, they failed to cause any infection on chillies and turmeric. In addition, differences in the measurements of sporodochia and in the character of the chlamydospores were noticed between the species of *Vermicularia* found on ginger and on chillies and turmeric. The disease is favored by continued wet weather and high humidity.—*A. Howard.*

1039. Valleau, W. D. **Over-summering of leaf rust of cereals in Kentucky.** Phytopathology 13: 338–340. 1923.—A study was made of clover fields following wheat, rye, and barley to determine whether the volunteer grain plants in such fields might not be a means of continuing the uredinial stage of the rusts throughout the summer. Where heads of grain were pressed into the soil by the binder at harvest time, some of the seed germinated immediately and the plants very soon showed uredinial pustules of the rusts. Such pustules continued to develop until late fall and might easily account for the early infection of fall sown grain.—*Adeline Ames.*

DISEASES CAUSED BY BACTERIA

1040. Ballard, Eduard, and Dorothy Norris. **Bacterial infection of cotton bolls.** Agric. Jour. India 18: 40–49. 1923.—The rotting and premature fall of the tender bolls of Cambodia cotton (*Gossypium hirsutum*) in South India appear to be largely due to a bacterial disease which is not *Bacterium Malvacearum* E.F.S. Angular leaf spot was not found at Coimbatore when this investigation was carried out. No fungus has been found associated with the disease in its early stage. Insects appear to play a prominent part in the dissemination of the disease by affording a ready means of entrance; the 2 which may be implicated in the spread of the disease are *Ragmus morosus* n. sp. MS. Capsidae, and *R. flavomaculatus* n. sp. MS. Capsidae. The organism considered responsible grows readily on a variety of culture media and produces moist, whitish, translucent colonies on cotton boll-extract agar.—*A. Howard.*

1041. Coleman, George E., and K. F. Meyer. **Some observations on the pathogenicity of B. botulinus. X.** Jour. Infect. Diseases 31: 622–649. 1922.—When very large numbers of detoxified spores of *B. botulinus* were administered, the organism invaded all of the organs of the animal body. When comparatively few spores were fed they entered no tissue, but when introduced into the blood steam they invaded all of the body. Spores of *B. botulinus* germinate and multiply in the fluids and tissues of the animal body and produce toxin there.—*R. L. Starkey.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

1042. Aubertot, Maurice. **Sur la dissémination et le transport de nématodes du genre Rhabditis par les Diptères.** [Dissemination of nematodes of the genus Rhabditis by Diptera.] Compt. Rend. Acad. Sci. Paris 176: 1257–1260. 1923.—The author reports experiments in which it is shown that the nematode *Rhabditis pellio* is disseminated by fruit flies, *Drosophila* spp.—*Frederick V. Rand.*

1043. Docters van Leeuwen-Reijnvaan, W., und J. Docters van Leeuwen-Reijnvaan. **Ueber die von Eriophyes pauropus Nal. an verschiedenen Arten von Nephrolepis gebildeten Blattgallen.** [Leaf galls formed by the mite E. pauropus on Nephrolepis spp. Ann. Jard. Bot. Buitenzorg 31: 83–91. *Pl. 14.* 1921.—The author details his studies of these galls, describing the different types found on species of *Nephrolepis.* A bibliography, and a list of species of *Nephrolepis* on which these galls were found, is appended.—*Frederick V. Rand.*

1044. Foëx, Et. **Les flagelloses des plantes à latex.** [Diseases caused by flagellates in latex-yielding plants.] Rev. Path. Vég. et Entomol. Agric. 10: 93–99. 1923.—This is a review with bibliography of the papers on the subject, with a list of the plants which have been reported as attacked by flagellates.—*J. Dufrenoy.*

1045. Leonard, Lewis T. **Mealy bugs on the roots and nodules of legumes growing in the field.** Science 57: 671–672. 1923.—The insect *Pseudococcus maratinus* Ehrh. has been found to attack and often destroy the nodules.—*C. J. Lyon.*

1046. Palm, Bj. **Aufzeichnungen über Zoocecidien. I-III.** [Notes on Zoocecidia.] Svensk Bot. Tidskr. 17: 30–61. *13 fig.* 1923.—The paper contains short descriptions of numerous galls collected by the author in different parts of Sweden, and is mainly a contribution to the geographic distribution of these plant diseases.—Part I deals with different galls principally from Swedish Lapland; part II with aphid galls and part III with galls caused by *Aphrophora spumaria* L.,—the two last-mentioned types collected in the neighborhood of Stockholm. The Aphrophora-galls are treated somewhat more in detail, and are said to occur on all kinds of plants and on almost all parts of the plants.—*O. Heilborn.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

1047. Bailey, Irving W. **Slime bodies of Robinia pseudo-acacia L.** Phytopathology 13: 332–333. *Pl. 16.* 1923.—Carefully fixed and stained specimens of the phloem of *Robinia pseudo-acacia* show slime bodies as described by Strasburger. In early stages these slime bodies are small, slender, and spindle shaped but later they enlarge and assume various shapes, similar to the bodies described by Nelson from mosaic infected bean and clover plants. The opinion is expressed that the bodies found by Nelson in these plants are slime bodies similar to those found in *Robinia.—Adeline Ames.*

1048. Brandes, E. W., and Peter J. Klaphaak. **Cultivated and wild hosts of sugarcane or grass mosaic.** Jour. Agric. Res. 24: 247–262. *4 pl.* 1923.—About 40 species of Gramineae have been tested and the following are definitely susceptible to mosaic: *Saccharum officinarum, Zea mays, Holcus sorghum, Pennisetum glaucum, Miscanthus sinensis, Saccharum narenga, Paspalum boscianum, Syntherisma sanguinalis, Chaetochloa lutescens, C. magna, Echinochloa crusgalli, Panicum dichotomiflorum, Brachiaria platyphylla.* Several varieties of the slender North India type of sugar cane, reputed to be immune, have been found susceptible to the disease but exhibit suppressed symptoms. Many varieties of maize when tested in southern fields proved susceptible but some are more so than others. Northern and Western

varieties, which did not make a good growth, did not show the disease. Southern varieties of maize showed reduction in yield varying from 0.4 to 50 per cent on account of the disease. *Aphis maidis* is the only insect vector noted.—Tests for seed transmission gave negative results.—*D. Reddick.*

1049. Dickson, B. T. **Raspberry mosaic and curl.** Sci. Agric. 3: 308–310. 1923.—This is an outline of the results obtained from investigational work on these diseases. The leaves of canes affected with mosaic show dark green blistering, rolling and distortion and, in dry weather, speckling, shortening of petioles, and broadening of leaf blades. The canes are yellowish and somewhat dwarfed. Early maturity and lack of flavor in the fruit are also characteristic. In Quebec, Cuthbert, Marlboro, King, Columbia, Newman 23, Herbert, Newman 1 and Newman 25 are the susceptible varieties, in the order named.—Leaf curl symptoms are dwarfing of petioles, dark green or yellow curled leaves, and thick, stocky, but dwarfed, canes. The fruit is later in maturing and bitter in flavor. Cuthbert, Marlboro, King, and Herbert are susceptible, but the disease has not been found on Columbia or the Newman varieties.—*Aphis rubiphila* is undoubtedly the infecting agent in both these diseases.—Destruction of badly diseased plantations and careful roguing in others are the only control measures which can be recommended.—*T. G. Major.*

1050. Doolittle, S. P., and H. H. McKinney. **Intracellular bodies in the phloem tissue of certain plants and their bearing on the mosaic problem.** Phytopathology 13: 326–329. *Pl. 15.* 1923.—Phloem tissue from healthy and mosaic-diseased plants of several species was studied in the fresh condition and also in fixed and stained sections. In both mosaic-free and mosaic-infected bean plants bodies were found singly and oriented longitudinally in the sieve tubes and adjoining tissues. They were of various shapes, not unlike protozoa, but lacking structural details (nuclei, blepharoplasts, and rhizoplasts). No motion could be detected in fresh material. Similar bodies were also found in mosaic-free and in mosaic-infected plants of red clover, peas, and alfalfa; they were not found in either diseased or healthy cucumber plants. Such bodies were described by Strasburger as occurring in the phloem tissues of the black locust. They were also reported by Haberlandt as occurring in various species of Leguminosae, but he failed to find them in any of the Cucurbitaceae. The occurrence of protozoa in mosaic-infected plants is considered not proved.—*Adeline Ames.*

1051. Foëx, Et. **Maladies à virus filtrants.—Mosaiques.** [**Filterable contagium diseases.—Mosaics.**]. [Rev. of: (1) Butler, E. J. **Some characteristics of the virus diseases of plants.** Sci. Prog. 17: 416–431. 1923. (2) Dickson, B. T. **Studies concerning mosaic diseases.** MacDonald Agric. Coll. Tech. Bull. 2. *125 p., 8 pl.* 1922 (see Bot. Absts. 12, Entry 1295). (3) Nelson, Ray. **The occurrence of protozoa in plants affected with mosaic and related diseases.** Michigan Agric. Exp. Sta. Tech. Bull. 58. *28 p., 18 fig.* 1922.] Rev. Path. Vég. et Entomol. Agric. 10: 88–93. 1923.—Among the mosaics 2 characteristic symptoms are produced: (1) mottling due to modifications in structure of the leaf chlorenchyma, and (2) the infectious nature of the juice of diseased plants. There is possibly also a 3rd characteristic,—the transformation of nitrates to nitrites.—A list of known mosaic hosts is quoted from Dickson.—The various other types of infectious chlorosis are mentioned together with their special distinguishing characters. Transmission of many of these diseases by sucking insects is emphasized and especially the tendency of these vectors to seek the phloem tissues. The main points supporting the enzymatic vs. the parasitic theories of causation are briefly outlined, together with published data relating these diseased conditions variously to bacteria and to protozoa.—*Frederick V. Rand.*

1052. Kofoid, Charles A., Henry H. P. Severin, and Olive Swezy. **Nelson's spiral bodies in tomato mosaic not protozoans.** Phytopathology 13: 330–331. 1923.—Both normal and mosaic infected plants were examined for protozoa. Material was fixed and stained by protozoological methods. Structures similar to those previously described by Nelson were found in both the normal and in diseased plants. These bodies are not like trypanosomes in that they have no undulating membrane, no marginal fibril arising from a centrosome, no parabasal body, and no nucleus of the flagellate type. The position and structure of these lead to the belief that they are dexiotropic cell contents of an albuminoid nature.—*Adeline Ames.*

1053. Kotila, J. E., and G. H. Coons. **Trypanosome-like bodies in Solanaceous plants.** Phytopathology 13: 324-325. 1923.—The investigation was undertaken to determine whether potato plants affected with mosaic, streak, and leaf-roll contained protozoa as described by Nelson in similar diseases. Fixed and stained sections of these plants showed trypanosome-like bodies in the phloem tissue. Mosaic tobacco and petunia plants also showed similar bodies. Study of potato and tomato plants known to be free from mosaic showed similar structures in the phloem. In all plants there was considerable variation in size and shape of these bodies. They showed no motility in fresh sections. Furthermore, when stained with protozoan stains, the bodies did not show internal differentiation as in protozoa. From these results the conclusion is drawn that the correlation of trypanosomes with mosaic and leaf-roll is not proved.—*Adeline Ames.*

1054. Krantz, F. A., and G. R. Bisby. **Relation of mosaic to running-out of potatoes.** Minnesota Agric. Exp. Sta. Bull. 197. *31 p., 18 fig.* 1921.—The most important factor in the running out of potatoes in Minnesota is the mosaic disease which causes much of the so-called curly dwarf. The term mosaic dwarf is used to designate the most severe symptoms of the disease. The disease was probably introduced on imported tubers and is perpetuated by the use of tubers from diseased plants. The disease can be transmitted artificially by (a) transferring the sap of diseased plants to those not diseased, (b) grafting portions of diseased plants on plants not affected, and (c) grafting diseased to healthy tubers.—The virus did not spread through the soil when diseased and healthy plants were grown side by side so that their roots crossed, and healthy plants did not become infected when grown in soil previously occupied by diseased plants. Prevention of infection was secured by excluding all insects after July 5, and healthy plants grown some distance from infected ones remained healthy. Environmental conditions were found greatly to influence infection. Infected plants are known to have been found in every variety tested in the U. S. A. and selection within the variety has not yielded immune strains. It may be possible to control mosaic by growing disease-free seed stock in isolated plots removed from all sources of infection. Roguing of diseased plants before the appearance of sucking insects on the plants is suggested as a means of eliminating the disease. —*A. C. Arny.*

1055. Magrou, J. **Virus filtrants et chlamydozoaires. [Filterable viruses and Chlamydozoa.]** Rev. Path. Vég. et Entomol. Agric. 10: 41–43. 1923.—Comparisons are drawn between the cellular inclusions described by Kunkel in mosaic-diseased maize and *Hippeastrum* and by Palm in tobacco mosaic; and the Negri bodies in rabies, the Guarnieri bodies in smallpox, and the supposed microorganisms of exanthematic typhus found in the human host and in the lice which transmit the disease.—Although the Chlamydozoa have thus been made the object of detailed classification their parasitic nature is scarcely established. Most authors are inclined to view these inclusions only as cellular disintegration products. Such phenomena have been observed in degenerating protoplasmic bodies. Furthermore, in the course of various intoxications inclusions resembling those of Negri have been found in the nerve cells. These bodies would seem to represent, then, a general mode of reaction of the nerve cell, not only against the parasite of rabies, but also against poisons of diverse nature.—*Frederick V. Rand.*

1056. Murphy, Paul A. **On the cause of rolling in potato foliage; and on some further insect carriers of the leaf-roll disease.** Sci. Proc. Roy. Dublin Soc. 17: 163–184. *Pl. 1, 12 fig.* 1923.—Excess of starch is a constant symptom in affected leaves, and its accumulation precedes rolling; as a consequence artificial darkening greatly delays rolling. Temporary rolling in healthy plants may be induced by removal of growing points and storage organs. Starch accumulation in leaves accompanies rolling due to other causes, such as injury to stalk and black-stalk rot. It is considered that the seat of the disturbance in translocation resides in the blades of leaves and not in the disorganized phloem of distant tissues. Neither rolling nor starch accumulation could be induced by low temperatures. Disorganized phloem was found in plants attacked by *Phytophthora infestans* or by eel-worms. In diseased leaflets starch disappearance proceeds from base to tip, a reversal of the normal. Capsid bugs (*Calocoris bipunctatus*) and jassids (*Typhlocyba Ulmi*) act as carriers of leaf-roll. Aphids (*Myzus Persicae*) on sprouts of unplanted tubers also act as carriers. The vapor of tetrachlorethane was found serviceable for ridding sprouted tubers of aphids.—*W. R. G. Atkins.*

1057. Wilbrink, G. Een onderzoek naar de verbreiding der gelestrepenziekte door bladluizen. [An investigation regarding the transmission of yellowstripe (mosaic) by aphids.] Mededeel. Proefsta. Java-Suikerindust. 1922: 413–456. 1922.—After a general and short, but very clear and inclusive discussion of the mosaic disease of sugarcane, its appearance and history of investigation, the author states that after reading Brandes' work she observed conditions in Java corroborating his results in the U. S. A.—Of the aphids used in experiments only *Aphis adusta* was able to transmit the disease. The mosaic was transmitted from cane to cane and from different grasses to cane or from cane to different grasses. Stripe disease spreads especially in moist localities, where grasses can hardly be weeded out. Toeton (*Panicum colonum*) seems to be very favorable for spreading the disease as it is susceptible and a good host-plant throughout the year for *Aphis adusta*. Mosaic was observed and transmitted to corn (*Zea Mais*) and sorghum (*Andropogon sorghum*).—*Peter J. Klaphaak.*

NON-PARASITIC DISEASES

1058. Marié, P. Note complémentaire relative à une récente communication sur les effets néfastes de la sécheresse de 1921 produits sur les chênes de certaines régions. [The injurious results of the dry summer of 1921 on oaks in some parts of France.] Rev. Path. Vég. et Entomol. Agric. 10: 76–77. 1923.—Following the dry summer of 1921, leaves fell late in fall while still green and before reserve substances had been translocated to the stem. This explains the depauperate condition of many oaks in the spring of 1922 and their death during the following winter.—*J. Dufrenoy.*

1059. Mason, T. G. Ligneous zonation and die-back in the lime (Citrus medica var. acida) in the West Indies. Sci. Proc. Roy. Dublin Soc. 17: 255–262. *Pl. 4, 9 fig.* 1923.—The zonation in the woody cylinders indicates a definite periodicity in cambial activity. Tangential bands of parenchyma occur in the more porous zone of vessels. The zones of vessels register leaf production, with adequate water, and the tangential parenchyma originates during drought. The latter tissue is irregularly distributed in shoots affected with die-back, and the appearance suggests sudden checks in cambial activity. Rapid and repeated desiccation of the meristem is suggested as an important factor in causing the dying back of shoots.—*W. R. G. Atkins.*

1060. Waldron, Max. Effect of lightning on citrus. Florida Grower. 28[1]: 5. 1923.—Lightning in central Florida is a very destructive agency in groves, usually killing 1 tree outright. The wound is scarcely perceptible, consisting as it does in the burning and resultant killing of the bark just at or below the surface of the ground. Rarely is any other mark found on the tree killed. However, the topmost twigs of the immediately surrounding trees are conspicuously and characteristically scorched. The distinguishing feature of the twig burning is that the internodes are burned to a gray color, usually but not always clear through to the cambium layer; while the buds and thorns remain unharmed and remain green for months after the rest of the twig is dead. The escape of the buds may be due to difference in morphological structure. The fibrovascular bundles of the twig consist of parallel, elongated cells, except at the bud where the cell structure is differentiated and diverted. If, therefore, the electric current follows the line of least resistance, the buds would escape.—In treating trees struck by lightning the burned twigs should be pruned out to the first fork or ring of growth back of the burned area. Trees partially girdled by lightning will very shortly produce a profuse bloom regardless of the season.—*J. C. Th. Uphof.*

DISEASES OF UNKNOWN CAUSE

1061. Anonymous. Tomato wilt experiments. Summary of the Bendigo Experiments for the prevention of "Spotted Wilt." Jour. Dept. Agric. Victoria 20: 34–36. 1922.

1062. Ciferri, R. Note sperimental sul "mal del piombo." [Experimental note on the silver leaf disease.] Rev. Patol. Veg. 13: 1–9. 1923.—Certain peach and cherry trees after a heavy pruning for the purpose of rejuvenation were noted to put out foliage with a metallic luster. In previous years the foliage had been normal. No fungus or animal parasites could be found in the wood of the tree. The diseased leaves proved to be more acid than normal

leaves and also contained cytase in greater quantity. The literature is reviewed in part and a bibliography is appended.—*F. M. Blodgett.*

1063. Dickson, B. T. **A study in disease susceptibility.** Sci. Agric. 3: 307. *1 pl.* 1923. —A leaf-spot disease of tobacco somewhat resembling wildfire has been observed in the experimental greenhouses of Macdonald College. Only plants affected with mosaic show the leaf-spots although non-mosaic plants were in close proximity to mosaic plants having the leaf-spot disease. So far only a Micrococcus has been isolated from the lesions. Further cooperative work is being carried out.—*T. G. Major.*

1064. Petri, L. **L'arricciamento della vite è una malattia prodotta da protozoi?** [Is the leaf curl of grapes a disease produced by protozoa?] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 32[1]: 395–397. *Fig. 1.* 1923.—In the phloem of the principal veins of grape leaves affected with leaf curl (arricciamento, roncet) were found elongated undulating bodies sometimes with polar filaments similar to those described by Nelson in plants affected with mosaic and leaf-roll.—*F. M. Blodgett.*

1065. Wilbrink, G. **Warmwaterbehandeling van stekken als geneesmiddel tegen de serehziekte van het suikerriet.** [Hotwater treatment of cuttings as treatment against sereh disease.] Mededeel. Proefsta. Java-Suikerindust. 1923: 1–15. 1923.—After a short review of hot water treatment in general and as applied to sugarcane by other workers, the author discusses her own experiments.—Cuttings of variety E. K. 28 used in 1921 were able to withstand 52–55°C. for ½ hour. Most other varieties, including Zwart Cheribon and Wit Preanger can not withstand this temperature. The material used consisted of cuttings from Zwart Cheribon affected with gumming disease and with sereh disease, and Wit Preanger cuttings affected with sereh disease. Cuttings affected wth gumming disease did not withstand a temperature of 52°C., a lower temperature than that required to kill healthy cane cuttings.—Sereh diseased Zwart Cheribon cuttings were heated for 30 and for 15 minutes in water at 52–55°C. All cuttings heated for ½ hour were healthy when they germinated. From those treated for 15 minutes, 4 out of 13 plants were sereh-diseased; while from the non-treated ones 12 out of 17 were sereh-diseased. In a repeated experiment all plants from the ½ hour treatment were healthy.—Badly sereh-diseased Wit Preanger were used for another experiment. The cuttings treated for ½ hour gave 9 out of 13 plants healthy, while those treated for 15 minutes gave no entirely healthy stool, but 11 stalks out of 90 were healthy. The untreated ones gave neither healthy plants nor healthy stalks.—Treatment for 30 minutes at 45 and then 30 minutes at 50–52°C. gave all healthy plants; for 30 minutes at 45 and then 30 minutes at 48–50°C. gave 7 out of 30 plants healthy, while the untreated gave no healthy stools and only 7 healthy stalks out of 131. Experiments with E. K. 28 show similar results.—It was observed that cane borers and scale were killed by the ½ hour treatment at 50–52°C. It seems probable to the author that the "roodsnot" fungus can be killed by the treatment, but not the mosaic disease. The hot water treatment proves to the author "that the sereh-disease is caused by a parasite, which is killed by certain temperatures." The author advises the use of this method only experimentally at first as the high temperature may kill the cane.—*Peter J. Klaphaak.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

1066. Anonymous. **Restrictions on import of plants and seeds into India.** Agric. Jour. India 17: 511–515. 1922.—A revised notification (No. 580–240 dated June 26th, 1922) under the Destructive Insects and Pests Act, 1914, has been issued by the Government of India and is printed in full.—*A. Howard.*

1067. Arnaud, G., et Mme. G. Arnaud. **Notes de pathologie végétale.** [Phytopathological notes.] Rev. Path. Vég. et Entomol. Agric. 10: 154–161. 1923.—The following plant pathogens among others are reported from the French Mediterranean coast: bacterial tumors on rose by [*Nerium oleander*]; *Bacterium Savastanoi* E. F. S. on olive trees; *Oidium Ceratoniae* on *Ceratonia siliqua; Nectriella miltina* on *Agave americana; Amphisphaeria Posidoniae* on *Posidonia oceanica; Gymnosporangium clavariaeforme* on *Juniperus communis; G. tremelloides* on *J. communis; G. Oxycedri* on *J. Oxycedrus;* and *G. gracile* causing witches'-brooms on *J. oxycedrus.* Witches'-brooms of unknown origin are reported on *Pinus halepensis.*—*J. Dufrenoy.*

1068. Bisby, G. R., and A. G. Tolaas. **The use of Bordeaux mixture for spraying potatoes.** Minnesota Agric. Exp. Sta. Bull. 192. *32 p., 4 fig.* 1920.—The use of Bordeaux sprays resulted in increased yields of potatoes at University Farm and at other locations in Minnesota. The potatoes sprayed were not affected with late blight. Late blight is often serious in the State and spraying with Bordeaux controls this disease.—*A. C. Arny.*

1069. Chabrolin, Ch. **Sur la toxicité du cuivre.** [Copper as a fungicide.] Rev. Path. Vég. et Entomol. Agric. 10: 132–137. 1923.—The results of Villedieu's experiments are criticized on the following ground: the toxic action of a certain volume of solution varies as the number of fungus spores varies. The more numerous the spores the better they resist, since each spore adsorbs some of the copper from the solution, and enough copper may be present to kill a few spores but not enough to kill many. Bordeaux mixtures act by gradually liberating copper into solution as it is adsorbed by fungus spores, and therefore the quantity of copper going into solution in a given time may not be sufficient to poison a large number of spores.—*J. Dufrenoy.*

1070. Coert, J. H. **Wortelrot in E. K. 28 in Kediri.** [Rootrot in E. K. 28 sugarcane in Kediri.] Mededeel. Proefsta. Java-Suikerindust. 1923: 291–307.—1923.—This article was written in answer to the question whether E. K. 28 was more susceptible and damaged by root-rot when planted after E. K. 28 than when other sugarcane varieties had preceded it. The results obtained were: (1) A 2-year rotation gives more chance for rootrot than a 3-year rotation because of a shorter period of non-occupation. (2) With a 3-year rotation a period of non-occupation may occur which differs but little from that of a 2-year rotation, due to late cutting of the standing crop and early planting of the next crop in the 3-year rotation, and an early cutting and late planting in the 2-year rotation. (3) Chances for rootrot are greater when E. K. 28 is planted after late-ripening varieties than when it is planted after early-ripening varieties. This explains the slightly higher percentage of rootrot in E. K. 28 when planted after E. K. 28, than when planted after other varieties. (4) On the red soils of Kediri (laterite soils) the chance for rootrot is small, probably due to the presence of oxidizing iron compounds in the soil.—*Peter J. Klaphaak.*

1071. Cole, C. F. **Two new varieties of blight-proof apple.** Jour. Dept. Agric. Victoria 20: 491–493. *2 fig.* 1922.—Two new varieties, Boswell and Cole, are described. Both are said to be immune to the wooly aphis (*Eriosoma lanigera*) and not susceptible to severe attacks of the black spot (*Venturia inequalis*). The Cole has shown a certain immunity against the latter. —If the flesh of the fruit of either variety is bruised, "the injured portion becomes dry and corky, soft rot not developing." Bitter pit or superficial pitting does not develop during storage of either variety.—*Wm. E. Lawrence.*

1072. Dufrenoy, Jean. **La transmission des maladies des plantes par voie biologique.** [Transmission of plant diseases through biologic agencies.] Rev. Pathol. Comparée 23: 336–343. *2 fig.* 1923.—This is a review of recent investigations pointing to the importance of problems connected with germ carriers, incubation periods, and the occurrence of protozoa in plant tissues.—*J. Dufrenoy.*

1073. Fawcett, Howard S. **Gum diseases of citrus trees in California.** California Agric. Exp. Sta. Bull. 360. *369–423, 15 fig.* 1923.—"The aim of this bulletin is to bring together the information now at hand regarding the so-called gum diseases of citrus and the various minor forms of gumming in citrus trees under California conditions. Special emphasis is here given to contributing conditions and to methods of prevention and treatment. A considerable amount of investigational data not heretofore published is included." Symptoms and general discussion of the following gum diseases are given in detail: Pythiacystis or brown rot gummosis, mal di gomma or foot rot, Botrytis gummosis, Sclerotinia gumming, psorosis or scaly bark of orange trees, Diplodia gumming, twig gumming, exanthema or die-back, and minor forms of gumming due to or associated with *Penicillium roseum, Fusarium* sp., *Alternaria* sp., *Bacterium citriputeale,* insect injuries, chemical stimuli, and physical effects of the environment.—*Frederick V. Rand.*

1074. Gram, Ernst, og Jens Lind. **Kortfattede, praktiske anvisninger til bekaem pelse af haveplanternes sygdomme.** [Short, practical instructions for the control of diseases of garden plants.] *5th ed., 90 p., 43 fig.* N. C. Roms: Copenhagen, 1921.

1075. Jones, L. R. **Experimental work on the relation of soil temperature to disease in plants.** Trans. Wisconsin Acad. 20: 433–459. *Pl. 33–37, fig. 1–4.* 1921.—An essentially new method of studying the relation of soil environment to parasitism is described. A summary is given of the chief problems undertaken along this line by the author and his co-workers at Madison, together with a list of published articles. The "Wisconsin temperature tank" is described and figured. The experimental results obtained in regard to the relation of soil temperature in 3 cases of parasitism of subterranean parts are discussed: (1) wilt disease of tomato caused by *Fusarium Lycopersici* (2) potato stem canker due to Rhizoctonia (*Corticium vagum*), and (3) tobacco root rot caused by *Thielavia basicola.* In conclusion, the writer suggests a number of physiological as well as pathological problems pertinent to this type of investigation, and emphasizes the need of cooperation between pathologists and physiologists, ecologists, geneticists, and plant culturists in any inquiry into the relation of environment to disease development.—*E. L. Fisk.*

1076. Köck, G., und L. Fulmek. **Pflanzenschutz. Leitfaden für den pflanzenschutzlichen Unterricht an landwirtschaftlichen Lehranstalten und für den Selbstunterricht. I–III.** [Plant protection. A guide for self instruction and for use in agricultural schools.] I. Feldbau [Field crops.] *vi + 78 p. 87 fig. (in pocket), 19 tables.* II. Obst- und Weinbau. [Orchard and vineyard crops.] *vii + 74 p., 147 fig.* III. Garten- und Gemüsebau. [Garden crops]. *vii + 88 p., 87 fig.* Carl Gerold's Sohns: Wien, 1922.—The general subject is divided into those diseases caused by the non-living environment, as relations of soil, air, water, light, etc.; diseases and injuries caused by organisms and comprising such diverse forms as weeds, parasitic phanerogams, fungi and bacteria; and a section on animal injuries including birds, mammals, insects, etc. With minor variations this general grouping is adapted to the various crop groups taken up in the 3 volumes, and under each disease is briefly given its characterization, importance, and control.—*Frederick V. Rand.*

1077. Kuyper, J. **Het wortelrot op Java, speciaal in verband met de rietsoort E. K. 28.** [Rootrot in Java, especially in relation to the cane variety E. K. 28.] Mededeel Proefsta. Java-Suikerindust. 1923: 117–161. *2 fig.* 1923.—The disease, its appearance etc., are discussed. It was determined that among the many factors influencing the appearance of rootrot, high water level in the soil and rapidly changing conditions of soil-moisture are the most important. Relation between the distribution of E. K. 28 and soil-water level is shown. Rootrot is usually combined with anaerobic soil conditions. The presence of many organic substances in the soil is unfavorable for cane, due to the formation of harmful chemical compounds under anaerobic or only slightly aerobic conditions. Rootrot in cane has been present for some time in the same districts and all cane varieties are more or less susceptible to it.—Two-year rotation has a decided influence on the appearance of the disease. The chance for rootrot seems to increase when there are only short intervals between plantings of cane. E. K. 28 is more susceptible than other varieties, but on the better soils, even when damaged to a slight extent, gives a better product than other varieties.—*Peter J. Klaphaak.*

1078. Orton, W. A., and R. Kent Beattie. **The biological basis of foreign plant quarantines.** Phytopathology 13: 295–306. 1923.—Plant parasites of one natural zone are often more virulent when introduced into another plant zone than at home where in equilibrium with hosts and associates. In a new country equilibrium is established only very slowly. Based on biologic principles the problem of foreign plant quarantine is distinct from that of domestic quarantine. In considering the problems relative to parasites introduced into America, the following points should furnish the basis for the investigation: (1) country where host is endemic, (2) nature of original host, (3) geographical distribution of host, (4) relationship to other economic plants of America, and (5) whether there are distinctly American strains of the host whose resistance to the parasite is unknown. In practically all recorded pest transfers the parasites were carried upon trees, roots, bulbs, or seeds. Intercontinental trade in plant-propagating material is dangerous and should be held within the narrowest possible limits. Importation of new varieties should be under strict government supervision.—*Adeline Ames.*

1079. Picado, C. **Anticorps expérimentaux chez les végétaux.** [Experimental antibodies in plants.] Ann. Inst. Pasteur 35: 893–901. *3 fig.* 1921.—Juice from an Opuntia stem, which had been injected with a suspension of pollen grains, dissolved and agglutinated a suspension of

pollen grains, whereas juice from normal stems or from stems injected with various solutions other than pollen suspensions did not. Antibodies seem then to develop in plants, but they are shown to be generic rather than specific. The pollenolysins seem to be relatively more specific than the polleno-agglutinins. If heated to 56°C. for ½ hour they lose the cytolytic power, which, however, may be restored by adding the juice from a normal *Opuntia* stem.—*Ernest Shaw Reynolds.*

1080. Quanjer, H. M. **Essais de résistance de variétés hollandaises de pomme de terre vis-à-vis de la maladie des taches en couronne et de la galle noire.** [The resistance of Dutch varieties of the Irish potato to "taches en couronne" and wart.] Rev. Path. Vég. et Entomol. Agric. **10**: 51–52. 1923.—The variety Triumph, recently obtained in the Netherlands by M. Veerkamp, proved to be resistant both to "maladie des taches en couronne" and to the wart disease (*Chrysophlyctis endobiotica*); and it is considered a most promising variety. "Taches en couronne" occurs in potatoes grown in sandy soil fertilized with animal dejecta and is characterized by brown spots in the flesh of the tubers. The cause is unknown.—*J. Dufrenoy.*

1081. Quanjer, [H. M.] **Un nouveau chapitre de la pathologie végétale reliant cette science à la pathologie animale.** [A new chapter of phytopathology relating this branch of science to animal pathology.] Rev. Path. Vég. et Entomol. Agric. **10**: 22–40. 1923.—While plant diseases differ from diseases affecting animals in that they are mostly local, recent investigations have disclosed plant diseases that may affect the organism as a whole. Such are diseases affecting the vascular system and more especially the phloem, and causing leaf-roll, mosaic, etc. These troubles in the plant are compared to fevers in animals or man; the analogy is further substantiated by the fact of transmission of many such diseases, both in animals and plants, through insect agency.—Problems of animal pathology may be illuminated through studies in plant pathology in the same manner that botanical investigations have explained fundamental questions of cellular structure and reproduction.—*J. Dufrenoy.*

1082. Smith, Erwin F. **Twentieth century advances in cancer research.** Jour. Radiology **4**: 295–317. *8 fig.* 1923.—This paper constitutes a critical review of the conspicuous features of a few of the outstanding experimental researches of the last 20 years dealing with cancers of plants, animals, and man from the standpoint of cause. "The most striking difference between the researches of the last 20 years and the earlier researches on cancer is that while formerly the chief dependence was placed on *observation*, latterly the open sesame of exact *experiment* has been added, and that too on a large scale, in many localities."—The detailed discussion of the subject is taken up under the following main headings: (1) transplantation experiments; (2) resemblances of crown gall to cancer; (3) Rous's filterable virus chicken sarcomas; (4) worm cancers; (5) experimental coal tar cancers; (6) anilin-dye cancers.—"To summmarize the subject in a few words: The cause of cancer, so far as we now understand it, may be defined as an irritation acting on an organ or organs unable to withstand it owing to a transmitted or an acquired weakness. Heredity alone cannot cause cancer, but irritation (parasitic and possibly also non-parasitic) plus heredity can and does cause it. No such conclusions could possibly have been drawn twenty years ago. They are the measure of progress we have made."—*Frederick V. Rand.*

1083. Stakman, E. C., J. G. Leach, and J. L. Seal. **Fruit and vegetable diseases.** Minnesota Agric. Exp. Sta. Bull. 199. *75 p., 38 fig.* 1922.—Methods of control and formulae for sprays and dusts are given. Illustrations aid in the identification of the diseases discussed.—*A. C. Arny.*

1084. Watson, E. A. **Animal pathology in relation to agriculture and public health** Sci. Agric. **3**: 345–349. 1923.—In dealing with this subject the writer urges cooperation between animal and plant pathologists in the study of botulism, ergotism, and various forms of forage poisoning.—*T. G. Major.*

1085. Winston, J. R., and W. W. Yothers. **Bordeaux-oil emulsion spray.** Proc. Florida State Hort. Soc. **34**: 145–149. 1921.—The results of tests to date seem to indicate that the Bordeaux-oil emulsion will prove effective in the control of certain fungus diseases of Citrus and at the same time prevent the abnormal increase of scale insects such as follows the use of plain Bordeaux mixture.—*Frederick V. Rand.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 636, 807, 1084, 1218)

1086. Anonymous. **A fungus bomb.** Sci. Amer. **128**: 223. 1923.—An illness is reported caused by the spores of a huge Calvatia which burst in the wainscoting of a house.—*Chas. H. Otis.*

1087. Ajon, Guido. **Estrattore a corrente continua di liquido.** [**A continual extractor.**] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **5**: 155–156. *Fig. 1.* 1919–1921.—The apparatus is described.—*A. Bonazzi.*

1088. Ajon, Guido. **Filtro multiplo a caldo.** [**A multiple filter with heating device.**] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **5**: 157–159. *Fig. 1.* 1919–1921.—A water-heated filter-rack for filtration of lemon extracts is described.—*A. Bonazzi.*

1089. Ajon, Guido. **Sulle essenze di limone. II. Distillazione frazionata e temperatura critica di soluzione.** [**Studies on lemon extracts. II. Fractional distillation and critical solution temperatures.**] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **5**: 133–139. *Fig. 2.* 1919–1921.—Critical solution temperatures are found to be dependent upon the type of solvent and its concentration in the extract. Sharp differences are obtained when this value is obtained for pure and adulterated extracts. The sensitivity of the measurement makes it fit for routine work in control laboratories.—*A. Bonazzi.*

1090. Ajon, Guido. **Sulle essenze di limone. III. Distillazione frazionata e composti carbonilici.** [**Studies on lemon extracts. III. Fractional distillation and carbonyl compounds.**] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **5**: 140–153. *Fig. 1.* 1919–1921.—The direct determination of citral by treatment with a mixture of Na_2SO_3 and Na_2CO_3 is studied but no definite conclusions are reached as to the applicability of the method to all conditions.—*A. Bonazzi.*

1091. Hehir, P. **The chaulmoogra plant in leprosy: An ancient remedy.** Lancet **204**[5185]: 110. 1923.—In this letter to the editor of the Lancet the author relates a thrilling story of the ancient use of the kalaw tree in the cure of leprosy. He states that chaulmoogra oil, obtained from the kalaw tree, has been in use in India for centuries as a remedy for leprosy and several skin diseases. Due to the work of Leonard Rogers, the ethyl esters of the acids from chaulmoogra oil are today yielding very satisfactory results in the leper asylums in the Province of Bihar and Orissa. The reports are encouraging.—*W. H. Tisdale.*

1092. **Казакевиу, А.** [Kazakewitsch, L.] **Видві и Формві валериан на юго-востоке.** [**Species and forms of Valerian in southeastern Russia.**] **Журнал опвітной агрономии юго-востока.** [Jour. Exp. Agron. Southeastern Russia] **1**[2]: 58–73. 1923.—Valerian finds in Southeast Russia favorable conditions for its growth due to its capability of withstanding severe drought. The content of ethereal oil is increased by the drought relation. In Southeast Russia the following Valerians are found: (1) steppe Valerian (*Valeriana dubia* Bge.); (2) tall Valerian (*V. exaltata* Mik.): (3) common Valerian (*V. officinalis* L. var. *typica* Korsh.); (4) tuberous Valerian (*V. tuberous* L.); (5) Volga Valerian (*V. wolgensis* nov. sp. (?)). The author suggests that up to recent times the last has possibly been confounded with *V. sambucifolia* Mik. He points to the successful harvesting of the Volga Valerian in large quantities at Kasan and Saratow as establishing the possibility and necessity of the industry and discusses the reasons why it should be cultivated. Particulars regarding the cultivation of the Volga Valerian are discussed, mention being made of the high temperature and moisture requirement for seed germination, propagation through division, the necessity of broad spaces between the rows, pruning, and the collection of the roots of 2–3-year old plants. According to the external quality of the drug, the author places the Valerians of the district in the following descending order: steppe, common, tall, and Volga. He gives the percentage of ethereal oil in the fresh roots of common Valerian as up to 0.62 per cent. Drying of the root

reduces the percentage to 0.3, due to the conversion of the oil to valeric acid. Preliminary analyses of cultivated steppe Valerian yielded about the same results. The percentage of valeric acid obtained from wild-growing Volga Valerian is significantly less. The author emphasizes the importance of further studies on the species and varieties of Valerian from the standpoint of yield and pharmaceutical value.—*H. W. Youngken.*

1093. Read, B. E., and Carl F. Schmidt. **The pharmacology of Tang Kuei.** Proc. Soc. Exp. Biol. and Med. 20: 395–396. 1923.—Tang Kuei, the root of *Angelica anomala* var. *chinensis*, is used in native medicine. A description is given of the chemical analysis and properties of this drug.—*M. M. Brooks.*

1094. Whitehouse, F. **A note on Japanese privet (Ligustrum japonicum).** Agric. Gaz. New South Wales 34: 596. 1923.—Feeding trials of this plant were made with hogs and a sheep. After several days feeding it was evident that the plant had not acted poisonously upon the animals.—*L. R. Waldron.*

PHYSIOLOGY

B. M. Duggar, *Editor*

William J. Robbins, *Assistant Editor*

(See also in this issue Entries 645, 648, 659, 667, 688, 732, 733, 737, 738, 743, 748, 750, 752, 754, 884, 985, 992, 1030, 1033, 1056, 1059, 1060, 1062, 1068, 1069, 1075, 1079, 1087, 1089 1090)

GENERAL

1095. Chamot, E. M. **Elementary chemical microscopy.** *2nd ed., xvi + 479 p.* Wiley & Sons: New York, 1921.—From the standpoint of the physiologist the new edition is of interest in particular reference to the discussion of the ultra-microscope and its use. As a whole the book has not been changed materially as compared with the 1st edition, printed in 1915.—*D. M. Duggar.*

1096. Costantin, Julien Noël. **Origine de la vie sur le globe.** [Origin of life on the earth.] *191 p., 31 fig.* E. Flammarion: Paris, 1923.

1097. Howard, G. L. C. **The rôle of plant physiology in agriculture.** Agric. Jour. India 18: 204–218. *Fig. 1–3.* 1923.—The physiological interpretation of agricultural practices is suggested as a profitable direction of progress. The effect of changes in the environmental conditions on the nature and quality of the produce is discussed and results in the case of wheat and leguminous crops are quoted. The value of a knowledge of physiology in the interpretation of field experiments is illustrated by a number of results obtained at Pusa, where the soil is exceedingly variable and where ordinary field experiments are out of the question. As the root system of varieties of the same species often vary greatly, the soil requirements of these types must be very dissimilar. Hence it is necessary in agricultural work to recognize the physiological individuality of varieties and even of unit species. The paper concludes with a discussion of acclimatization and change of seed.—*A. Howard.*

1098. Lumière, Auguste. **Rôle des colloïdes chez les êtres vivants.** [The rôle of colloids in living organisms.] *311 p., 20 fig.* Masson & Cie: Paris, 1922.

1099. Lumière, Auguste. **Theorie colloidale de la biologie et de la pathologie.** [The colloidal theory and its relation to biology and pathology.] *203 p.* (Bibliotheque de synthèse scientifique.) Chiron: Paris, [date?].

1100. Molliard, M. **Nutrition de la plante. I. Echanges d'eau et des substances minerales.** [Plant nutrition. I. Water and mineral substances.] *xiv + 395 p.* **II. Formation des substances terraires.** [Formation of complex substances.] *vi + 438 p.* **Encyclopedie scientifique: Bibliotheque de physiologie et de pathologie vegetales.** Gaston Doin: Paris, 1921.—The scope of this series of books includes the behavior of the living plant in health and in disease. The water relations are discussed at some length, likewise the absorption of mineral constituents from soil. The salt relation problem is not developed as extensively as might be assumed in consideration of the recent developments in this field. Similarly, the important newer work on colloidal phenomena in soils is omitted from consideration. Part II

deals with the building up of the complex organic compounds characteristic of the plant body, their transformation in the cells, and the distribution or translocation of such substances from the region of production to the region of use or storage. Much of the value of the work on this part is due to the bringing together of chemical and plant physiological data.—*B. M. Duggar.*

1101. Phillips, Thomas Guthrie. **Fundamentals of organic and biological chemistry with a foreword by Alfred Vivian.** D. Appleton Co.: New York, London, 1923.

1102. Rosenthaler, L. **Grundzüge der chemischen Pflanzenuntersuchung. [Outlines of plant chemistry.]** *2nd rev. ed., iv + 115 p.* J. Springer: Berlin, 1923.

PROTOPLASM, MOTILITY

1103. Henrici, Arthur T. **Differential counting of living and dead cells of bacteria.** Proc. Soc. Exp. Biol. and Med. 20: 293–295. 1923.—A procedure is described enabling one to determine the size and form of the cells and to differentiate living and dead cells.—*M. M. Brooks.*

1104. Loeb, Leo. **Amoeboid movement, tissue-formation and consistency of protoplasm.** Amer. Jour. Physiol. 56: 140–167. *8 fig.* 1921.—Limulus "cellfibrin tissue" prepared for experimental purposes, as in former work, was treated with various partial molecular concentrations of several salts. The emigration of cells and their amoeboid movements show that a $\frac{M}{2}$ NaCl solution gives the optimum osmotic pressure, approximating Limulus serum. The pseudopods and movements are modified by varying kinds and concentrations of salts, length of application and temperature. Changes in the consistency of protoplasm and its surface tension are held responsible for amoeboid movements. The formation of pseudopods and of fertilization membranes around ova are believed to be due to similar processes.—*Ernest Shaw Reynolds.*

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL PHENOMENA

1105. Ayers, S. Henry, Philip Rupp, and William T. Johnson, Jr. **The influence of surface tension depressants on the growth of Streptococci. VI. Studies of the Streptococci.** Jour. Infect. Diseases 33: 202–216. *Fig. 1.* 1923.—The effects of surface tension depressants can be varied by the composition of the medium and different species of Streptococci react differently in their ability to grow at lowered surface tension. An infusion-peptone-dextrose medium having an initial surface tension of 57–59 dynes was used in most of the work. Reducing surface tension to 43.7 dynes with ricinolate depressed growth in most cases. *Streptococcus lactis* was the most resistant. With sodium glycocholate, sodium taurocholate, isoamyl alcohol, and sodium oleate growth was not stopped appreciably at a surface tension of 42.8 dynes. Below 40 dynes most growth with the Streptococci cultures used was prevented. The surface tension depressing growth was not the same for all depressants used. Both the surface tension in dynes and the nature of the depressant influenced growth. The nature of the action of the depressants is not that of corrosive poisons. Increased salt content and lowered initial reaction increased the influence of the depressants. The surface tension test may aid in classifying Streptococci.—*R. L. Starkey.*

1106. Brooks, Matilda Moldenhauer. **New quantitative observations on the penetration of acids and alkali bicarbonates into living and dead cells.** Proc. Soc. Exp. Biol. and Med. 20: 384–385. 1923.—Cells of the single-celled green alga *Valonia* were placed in solutions of acids and of alkali bicarbonates. Two determinations of the pH of the sap were made: 1 with the free CO_2 present and 1 without free CO_2. The acids used could be divided into 2 classes: (1) those which increased the amount of free CO_2 present in the cell, presumably by decomposing bicarbonates, and apparently penetrating slowly: (2) those producing little or no free CO_2 and penetrating rapidly. Dead cells behave somewhat like living cells. Living cells placed in solutions of bicarbonates showed an increase in the amount of free CO_2 in the sap and also an increase in the alkalinity of the sap. This process is more rapid when $KHCO_3$ is used than in the case of $NaHCO_3$.—*M. M. Brooks.*

1107. Brooks, Matilda Moldenhauer. **The penetration of arsenic into living cells.** Proc. Soc. Exp. Biol. and Med. 20: 39–40. 1922.—A study of the penetration of arsenic into

the fresh water alga, *Nitella*, was made. The cells were placed in solutions of phosphate buffers, arsenic buffers, and phosphate buffers plus 0.05 M atoxyl, of various H-ion concentration (pH 5.6–7.5). The sap was analyzed for arsenic by the Gutzeit method. Both H ions and buffer salt ions had an influence upon the condition of *Nitella*. No arsenic penetration was observed between pH 5.6 and 6.4 while positive tests were obtained at all higher pH values with a maximum at pH 7.5, which was the most alkaline solution used.—*M. M. Brooks.*

1108. Butler, Raymond Renard. **Surface phenomena in sucrose solutions.** Jour. Chem. Soc. [London] 123: 2060–2065. *2 fig.* 1923.—This is a preliminary report of an investigation undertaken to find an explanation of the exosmosis phenomena shown by Czapek to occur when plant cells are immersed in solutions having surface tensions of 0.65–0.68 relative to water.—*F. E. Denny.*

1109. Falk, I. S., and H. J. Shaughnessy. **Effect of certain electrolytes on the buffering power of Bacterium coli.** Proc. Soc. Exp. Biol. and Med. 20: 426–428. 1923.—A bacterial suspension in water is titrated electrometrically with HCl and NaOH and the "buffer ratios" obtained between pH 2 and 12. NaCl and $CaCl_2$ depress the buffer ratios. A similar reduction in the buffer ratio is attained when the reaction is alkaline as well as when acidic, suggesting an alkaline isoelectric point for bacteria.—*M. M. Brooks.*

1110. Irwin, Marian. **The penetration of dyes as influenced by hydrogen ion concentration.** Jour. Gen. Physiol. 5: 727–740. *Fig. 1–4.* 1923.—Using *Nitella* sp. it was found that the penetration of the dye cresyl blue into the living cells increased as the pH increased, over the range pH 6.6–9.0. It is thought that this may be attributed to an increase in active protein (or other amphoteric electrolyte) in the cell which may combine with the dye.—*O. L. Inman.*

1111. Larson, W. P., and Irwin A. Montank. **The effect of wetting on the pathogenicity and viability of the tubercle bacillus.** Proc. Soc. Exp. Biol. and Med. 20: 229–232. 1922.—When a virulent culture of this organism was grown in glycerin broth to which had been added sufficient soap to depress the surface tension to 44 dynes, growth was slower and the pathogenicity was lost.—*M. M. Brooks.*

1112. Lloyd, Francis E. **A method of ultra-microscopy whereby fluorescence in the Cyanophyceae and Diatomaceae may be demonstrated.** Science 58: 91–92. 1923.—With the algae mounted in glycerin on a thin object slide, the dark field condenser is raised until the hollow light cone is reflected from the upper surface of the cover glass. This reflected light will show the fluorescence of the pigments in many of the blue-green algae.—*C. J. Lyon.*

1113. Neumann, Hugo. **Zur Kenntnis der Brownischen Molekular-Bewegung im Pflanzenreich.** [Brownian molecular movement in plants.] Beih. Bot. Centralbl. I Abt. 40: 141–161. 1923.—This phenomenon is found in the cells of all plants, from unicellular algae to the highest families of phanerogams, and in all organs. Many examples are given.—The conditions necessary for the phenomenon are the presence of a suspension medium (cell sap or protoplasm) and of small particles 1–15 μ. The latter may be solids or fluids, for example, calcium oxalate crystals, or gypsum crystals (as in *Closterium*), or inorganic bodies. Changes in temperature or viscosity modify the movements.—*L. Pace.*

1114. Raber, Oran. **Permeability of the cell to electrolytes.** Bot. Gaz. 75: 298–308. 1923.—After reviewing the theories of Hofmeister, Loeb, and others pertaining to protoplasmic behavior in the presence of electrolytes, the writer presents a new interpretation in this field, which he believes "explains more of the permeability phenomena by a single explanation than have thus far been explained by any one contribution."—The writer imagines the plasma membrane to be composed of a network of negative particles (Laminaria) which in contact with "negative" salts (NaCl, Na_2SO_4) will introduce an electrical situation which will cause the meshes to expand (increased permeability). "Positive" salts ($CaCl_2$, $FeSO_4$) will induce contraction. The anions of the salts in the negative class, the writer explains, carry the "more dense charge" (Na_2SO_4) or the charge is approximately equal to that of the cation (NaCl), while in the positive class the cation carries the higher potential ($CaCl_2$). The phenomenon of antagonism is thus held to be the maintenance of the normal protoplasmic condition through the fact of balanced electrical conditions as regards the ions in the plasma membrane. The reverse in permeability in the presence of a positive salt like $CaCl_2$, the

writer explains, is due to the fact that "as the negative charges are later replaced by those carried by the dominant action of the cation of the salt, the units again repel each other, and permeability is increased."—The author attacks the lipoid-membrane theory of Overton, interpreting his work with dyes on an ion basis the dye ions reacting as those of salts when in contact with the protein elements of the plasma membrane.—*B. W. Wells.*

1115. Winslow, C. E. A., I. S. Falk, and M. F. Caulfield. **The influence of certain electrolytes upon the electrical charge of bacteria.** Proc. Soc. Exp. Biol. and Med. 20: 428–430. 1923.—The velocity of migration of bacteria in unbuffered suspensions was observed through the microscope. There is an isoelectric point at about pH 2.0 and a 2nd isoelectric point (alkaline) at about pH 12. Sodium and calcium salts depressed the velocity migration. A solution of 0.145 M $CaCl_2$ is more potent than one of 0.725 M NaCl and there appears to be an antagonistic effect of the 2 salts at reactions between pH 3.0 and 7.0.—*M. M. Brooks.*

WATER RELATIONS AND TRANSPORT

1116. Anonymous. **The transport of organic substances in plants.** Sci. Amer. 128: 323. 1923.—This is a brief report of an address by H. H. Dixon before the British Association for the Advancement of Science.—*Chas. H. Otis.*

1117. Dixon, H. H., and N. G. Ball. **On the channels of transport from the storage organs of the seedlings of Lodoicea, Phoenix and Vicia.** Sci. Proc. Roy. Dublin Soc. 17: 185–196. *Pl. 5., 19 fig.* 1923.—The total cross-section of the phloem of all the bundles in the haustoria of the palms is much greater than that of the bundles in the transmitting organs (petioles), while the total cross-section of the xylem of the bundles of the petioles is about equal to that of the xylem of the haustoria. In *Vicia* the tracheal elements are differentiated in the petiole of the cotyledons much earlier than are the sieve-tubes. Before the latter are formed considerable transport of organic substances to the embryo takes place. Thus anatomical evidence favors the view that the tracheae, and not the sieve-tubes convey organic substances. In the haustorium of *Lodoicea* peculiar, large, elongated cells occur in the parenchyma connecting the sheaths of adjacent bundles, and sheaves of narrow tubular elements are found in the bundles which emerge from them and pass towards the surface of the haustorium in its intercellular spaces.—*Henry H. Dixon.*

1118. LaRue, Carl D. **Simple weighing device for large-scale transpiration experiments.** Bot. Gaz. 75: 209–210. 1923.—The author suggests the use of a warehouse truck to carry the scale to the containers, the latter resting on cross-boards at the requisite height.—*B. W. Wells.*

1119. Livingston, Burton E. **Blackened spheres for atmometry.** Science 58: 182–183. 1923.—If blackened spheres can not be obtained, lampblack applied to the white sphere will serve through rainless periods or in greenhouses. Directions are given for the proper application and removal of the lampblack.—*C. J. Lyon.*

MINERAL NUTRIENTS

1120. Atkins, W. R. G. **The hydrogen ion concentration of the soil in relation to the flower colour of Hydrangea hortensis W., and the availability of iron.** Sci. Proc. Roy. Dublin Soc. 17: 201–210. 1923.—The plant produces blue flowers in soil at pH 6, but pink at pH 7.5. Plants exhibit blue, pink, and intermediate shades between these limits. Blue and pink petals were found to occur at pH 4.2, so indicator changes cannot account for the difference. Macallum's haematoxylin test and quantitative analysis show that blue flowers are richer in "inorganic" iron than are the pink. Ferric salts are precipitated completely at pH values below those at which plants commonly grow, so they must utilize iron in the ferrous state only. Traces of the latter still exist in solution beyond pH 7.1, but it occurs in greater abundance in more acid soils. The precipitation limits for ferrous and ferric salts are of significance in connection with the occurrence of chlorosis and of iron pan in soils.—*W. R. G. Atkins.*

1121. Bertrand, Gabriel et Mme. Rosenblatt. **Recherches sur la présence du manganèse dans la règne végétal. [Manganese in the vegetable kingdom.]** Ann. Inst. Pasteur 35: 815–819. 1921.—By accurate analytic methods properly adjusted to the special material, the authors demonstrated manganese in plants which by less careful methods have been reported

as lacking this element. It is concluded that the presence of manganese is absolutely general in plants.—*Ernest Shaw Reynolds.*

1122. Fritsch, R. **Findet sich Selen im pflanzlichen und tierischen Organismus?** [Does selenium occur in plants and animals?] Zeitschr. Physiol. Chem. 109: 186–188. 1920.—This is a critical reply to Gassmann [see following entry] in which the author denies the presence of selenium in animals and plants, and criticises the methods of Gassmann as grossly erroneous. —*Chas. A. Shull.*

1123. Gassmann, Th. **Zum Nachweis des Selens in Menschen- Tier-, und Pflanzenorganismus.** [Detection of selenium in man, animals, and plants.] Zeitschr. Physiol. Chem. 108: 38–41. 1919.—A method of detecting selenium qualitatively and quantitatively is given. Five gm. of ash are extracted for 2 days with absolute alcohol, to dissolve the complex selenium and magnesium compounds. The solution is evaporated down with gentle heat till it forms a syrupy brown residue. This is dissolved in aqua regia. The solution is treated with H_2S with removal of excess acid, and the selenium complex separates out from the magnesium compounds as a precipitate. This precipitate is oxidized from fuming nitric acid, and the resulting selenic-acid-selenium-oxide complex, is precipitated with $AgNO_3$. The end product is selenium oxide. This oxide must be made the basis of quantitative measurements. For qualitative tests, the precipitate is washed until all silver has been removed, and the oxide is reduced to selenium, either by ashing the filter and precipitate and reducing with metallic sodium, or, by dissolving in aqua regia, evaporating to dryness, taking up the residue in hot water, and heating with a little NaOH. Characteristic crystals of metallic selenium form. [See also preceding entry.]—*Chas. A. Shull.*

1124. Gericke, W. F. **On the adaptation of wheat to growth media deficient in nutrients.** Science 58: 17. 1923.—The largest yield of grain per culture from tap water came from the variety that ripened first. This correlation does not exist in fertile soil.—*C. J. Lyon.*

1125. Latshaw, W. L. **Report on sulfur and phosphorus in the seeds of plants.** Jour. Assoc. Official Agric. Chem. 6: 414–418. 1923.—The bomb, magnesium nitrate, and the official method are discussed. Preference was given to the magnesium nitrate method.—*F. M. Schertz.*

1126. Lesage, Pierre. **Action comparée de la sylvinite et de ses composants sur les premièrs développements des plantes.** [The action of sylvinite and its constituents on the primary development of plants.] Compt. Rend. Acad. Sci. Paris 175: 992–995. 1922.—Plants were grown in culture solutions and sprayed with the sylvinite or grown in soil with which this material had been mixed. Sylvinite is found to contain 35 per cent KCL, 55 per cent NaCl, 0.5 per cent $MgCl_2$, 3.4 per cent $CaSO_4$. The plants used were *Lepidium sativum*, oats, and wheat. Growth was compared in sylvinite, in each salt separately, and in other mixtures of the constituent salts. It is found that other mixtures are more favorable than the separate salts, but less favorable than sylvinite.—*C. H. Farr.*

1127. Patten, A. J. **Report on the determination of iron and aluminum, calcium and magnesium in the ash of seeds.** Jour. Assoc. Official Agric. Chem. 6: 418–420. 1923.

1128. Stockholm, Mabel, and Fred C. Koch. **A quantitative method for the determination of total sulfur in biological materials.** Jour. Amer. Chem. Soc. 45: 1953–1959. 1923.

PHOTOSYNTHESIS

1129. Eisler, M., und L. Portheim. **Über die Bildung von Sauerstoff aus Kohlendioxyd durch Eiweiss-Chlorophyllösungen.** [Oxygen production from carbon dioxide by protein-chlorophyll solutions.] Biochem. Zeitschr. 135: 293–298. 1923.—Four parts of horse serum diluted 1–20 were added to 1 part of a 95 per cent alcohol extract of grass. The precipitate or protein-chlorophyll was purified and dissolved in 0.85 per cent NaCl or in a $\frac{M}{10}$ mixture of $NaHCO_3$ and Na_2CO_3 (85:15). When this solution was exposed to light, gas pressure developed, as measured by a Haldane differential blood-gas manometer. No increase of pressure developed in the dark. Analysis of the air by a Haldane gas apparatus showed that after prolonged exposure to light, oxygen was produced from CO_2.—*H. D. Hooker, Jr.*

METABOLISM (GENERAL)

1130. Anderson, R. J., and M. G. Moore. **A study of the phytosterols of corn oil, cotton-seed oil, and linseed oil.** Jour. Amer. Chem. Soc. 45: 1944–1953. 1923.

1131. Benton, A. G. **Studies on quantitative determination of fat in micro-organisms.** Proc. Soc. Exp. Biol. and Med. 20: 512–513. 1923.—A method is described for obtaining fat from micro-organisms.—*M. M. Brooks.*

1132. Boresch, Karl. **Phykoerythrin in Cyanophyceen.** [Phycoerythrin in Cyanophyceae.] Ber. Deutsch. Bot. Ges. 39: 93–98. 1921.—*Phormidium Retzii* was dried at 45°C., ground with quartz sand, and extracted by the addition of a little water and toluol at room temperature. Solutions prepared thus were examined by means of the Zeiss comparison spectroscope. Two strong bands, between the Frauenhofer lines C and D and D and E, were present. Measurements were also made by means of the König-Martens spectrophotometer and curves are shown in the paper. Other solutions of the pigments also were used.—*F. M. Schertz.*

1133. Branhofer, Karl, und Julius Zellner. **Chemische Untersuchungen über Pflanzengallen. III.** [Chemical studies of plant galls. III.] Zeitschr. Physiol. Chem. 109: 166–176. 1920.—Analyses of the gall produced on pines by *Chermes Abietis*, of that on the red beech produced by *Hormomyia Fagi*, and of the normal sprouts and leaves are given. The main chemical fact in gall formation is the presence of larger quantities of low molecular weight crystalloids, or at least readily diffusible substances. These include minerals, organic acids, sugars, simple nitrogenous bodies, tannins, and related compounds.—*Chas. A. Shull.*

1134. Branhofer, Karl, und Julius Zellner. **Zur Chemie der Succulenten.** [Chemistry of succulents.] Zeitschr. Physiol. Chem. 109: 12–15. 1920.—Analyses of *Sedum telephium, Sempervivum hirtum, Euphorbia coerulescens, Opuntia monacantha*, and *Aloe vera* are given. The analyses include water-soluble materials, ash, reducing sugars, mucilaginous carbohydrates, pectic materials, and total nitrogen.—*Charles A. Shull.*

1135. Collip, J. B. **The demonstration of a hormone in plant tissues to be known as "glucokinin."** Proc. Soc. Exp. Biol. and Med. 20: 321–323. 1923.—Administration of extracts made from yeast, green onion tops, onion roots, barley roots, sprouted grain, green wheat leaves, bean tops, and lettuce produce a marked fall in the percentage amount of blood sugar in depancreatized dogs.—*M. M. Brooks.*

1136. Dutcher, Adams, and Julia Outhouse. **The vitamin content of raisins, dried raisin seeds and raisin seed oil.** Proc. Soc. Exp. Biol. and Med. 20: 450–451. 1923.—Vitamin A and B content of Thompson seedless raisins, loose Muscat, seeded Muscat, and raisin seed oil are discussed. Vitamin C was not found in any of the above substances.—*M. M. Brooks.*

1137. Franzen, H., und F. Helwert. **Über die chemischen Bestandteile grüner Pflanzen. XXIV. Kritisches über das Vorkommen der Citronensäure in den Pflanzen.** [The occurrence of citric acid in green plants.] Biochem. Zeitschr. 135: 384–415. 1923.—Citric acid probably occurs in leaves of *Nicotiana Tabacum*, in unripe berries of *Morus nigra* and in the fruit of *Adansonia digitata*. Its presence has been established in only 16 plants: in the bark of *Pirus malus*, in tops and roots of *Richardsonia scabra*, in the bleeding sap of *Vitis vinifera*, in leaves of *Prunus cerasus* in the juice of *Saccharum officinarum*, in the fruit of *Vaccinium oxycoccus, Pirus Aucuparia, Citrus Aurantium, Ribes rubrum* and *Prunus avium*, in the roots of *Rubia tinctorum*, in the tops of *Chelidonium majus* and in seeds of *Pisum sativum, Vicia sativa, V. Faba*, and *Lupinus* sp.—*H. D. Hooker, Jr.*

1138. Franzen, H., und E. Keyssner. **Über die chemischen Bestandteile grüner Pflanzen. XXIII. Kritisches über das Vorkommem der Apfelsäure in den Pflanzen.** [The occurrence of malic acid in green plants.] Biochem. Zeitschr. 135: 183–216. 1923.—A critical survey of the literature shows that malic acid probably occurs in leaves of *Geranium zonale, Sempervivum tectorum, Nicotiana Tabacum, Bryophyllum calycinum*, and *Opuntia versicolor*, in stem and leaves of *Rheum undulatum* and *R. palmatum*, in the fruit of *Rhus Coriaria, Prunus spinosa*, and *P. cerasus*, and in the milk sap of *Euphorbia resinifera*. Malic acid has been demonstrated to occur in only 15 plants: in the leaves of *Fraxinus excelsior* and *Echeveria secunda glauca*, in the fruit of *Pirus aucuparia, P. domestica, Cerasus caproniana, Hippophae rhamnoides, Ribes rubrum* and *Prunus avium*, in tubers of *Solanum tuberosum*, in the tops of *Artemisia*

Absinthium, *Chelidonium majus* and *Oxylobium parviflorum*, in the roots of *Beta vulgaris*, in the stem of *Rheum officinale*, and in the sap of *Acer saccharinum*.—*H. D. Hooker, Jr.*

1139. Fritsch, R. **Versuche zur Darstellung von Phosphatiden aus gefärbten Pflanzenorganen.** [Attempts at preparation of phosphatides from colored plant organs.] Zeitschr. Physiol. Chem. **107**: 165–175. 1919.—The colored parts of the plants examined, leaves of nettle, spinach, ash, maple, contained very small amounts of phosphatides, and only 3.46–4.78 per cent of the total phosphorus was found in lipoids. The green parts contained no calcium inositol phosphate. The preparation of compounds with the theoretical amount of phosphorus is very difficult, and the final product is usually dark colored from decomposition products of the pigments. Grass, when stored in silos, loses most of its phosphatides by decomposition to less complex compounds.—*Chas. A. Shull.*

1140. Funk, Casimir, Benjamin Harrow, and Julia B. Paton. **Extraction of vitamines from yeast and rice polishings using various water-miscible solvents.** Proc. Soc. Exp. Biol. and Med. **20**: 423–424. 1923.—Various solvents (ethyl, methyl, propyl, butyl, and isobutyl alcohol, acetone, methyl ethyl ketone, and acetic acid) in different per cent solutions on rice polishings were used. It was found that 60 per cent alcohol is better than 70 per cent in producing an active extract.—*M. M. Brooks.*

1141. Hirai, K. **Über das Vorkommen von p-Oxybenzaldehyd und p-Oxybenzoesäure bei der bakteriellen Tyrosinzersetzung, mit besonderer Berücksichtigung des dabei gebildeten Melanins.** [The formation of p-hydroxybenzaldehyde and p-hydroxybenzoic acid in the bacterial decomposition of tyrosin, with special reference to melanin formation.] Biochem. Zeitschr. **135**: 299–307. 1923.—*p*-Hydroxybenzaldehyde and *p*-hydroxybenzoic acid were isolated from *l*-tyrosin solutions that had been acted on by *Proteus vulgaris* in Ringer's solution. After about 3 weeks melanin appeared. No melanin formation occurred in solutions of *l*-tryptophane, *dl*-phenylalinin or *l*-leucin. The presence of glycerol prevented melanin formation from tyrosin, except in the presence of spongy platinum. The melanin formed was precipitated by lead acetate, taken up in alcohol, deleaded, and purified by precipitation with acid and by solution in alkali until Millon's test was not given. This product contained no nitrogen, sulphur, or iron. It was soluble in alkali, alcohol, formic acid, glacial acetic, methyl alcohol, phenol, and ether.—*H. D. Hooker, Jr.*

1142. McClendon, J. F., and Cecilia Shuck. **The presence of anti-ophthalmic vitamin and the absence of anti-rachitic vitamin in dried spinach.** Proc. Soc. Exp. Biol. and Med. **20**: 288. 1923.—When spinach was fed to rats it was found to produce a favorable effect in cases of ophthalmia.—*M. M. Brooks.*

1143. Molisch, Hans. **Beiträge zur Mikrochemie der Pflanze. Nr. 16. Zur Silberreduktion der Chlorophyllkörner.** [The microchemistry of plants. No. 16. Reduction of silver by chlorophyll grains.] Ber. Deutsch. Bot. Ges. **39**: 136–139. 1921.—The living chlorophyll bodies of most plants reduce silver nitrate, 0.25–1.0 per cent solution, the solution becoming brown and finally black. Only a few exceptions were found among the phanerogams, but many exceptions were found among the algae. After lead acetate solution has throughly killed the cells, no reduction takes place. If the cells are not completely killed, they reduce the silver nitrate.—*F. M. Schertz.*

1144. Molisch, Hans. **Über eine auffallende Farbenänderung einer Blüte durch Wassertropfen und Kohlsäure.** [A striking color change of a blossom caused by drops of water and carbonic acid.] Ber. Deutsch. Bot. Ges. **39**: 57–62. 1921.—Ipomoea flowers change from blue to red when the flower is moist, in the presence of air high in CO_2. When the blossom is placed in 10 per cent CO_2 the change takes place in 1–2 minutes. The color change is reversible.—*F. M. Schertz.*

1145. Oppler, Berthold. **Die Mikrobestimmung des Traubenzuckers nach den Verfahren von. J. Bang.** [Microestimation of grape sugar according to Bang's procedure.] Zeitschr. Physiol. Chem. **109**: 57–64. *1 fig.* 1920.—The ratio of weight of grape sugar to the number of cc. of $\frac{N}{100}$ iodate solution is not constant, but varies from 1:2.78 to 1:1.19, as the concentration of the sugar decreases. Empirical tables would be necessary if Bang's method were used. For amounts of sugar less than 1 mg., Bertrand's method is considered more accurate.—*Chas. A. Shull.*

1146. Read, J. W. **Concerning the vitamin B content of the velvet bean.** Science **57**: 750. 1923.—It has been definitely proved that vitamin B is abundant and stable towards heat in the pods but less so in the seeds.—*C. J. Lyon.*

1147. Sasaki, Takaoki, und Ichiro Otauka. **Über die Bildung der rechtsdrehenden β-Furyl-α-milchsäure durch Proteusbakterien.** [**Dextrorotatory β-furyl-α-lactic acid formation by Proteus bacteria.**] Biochem. Zeitschr. **135**: 504–505. 1923.—Two gm. of dl-furylalanin were incubated for 25 days with Proteus bacteria. The solution was made acid, filtered, extracted with ether, and the ether evaporated. One grain of material crystallized from the remaining syrup which corresponded in melting point, rotation, and empirical formula to β-furyl-α-lactic acid.—*H. D. Hooker, Jr.*

1148. Sponsler, O. L. **Structural units of starch determined by X-ray crystal structure method.** Jour. Gen. Physiol. **5**: 757–766. *Fig. 1–7.* 1923.—By the use of X-ray methods the author gives evidence to show that starch is built up of units arranged in concentric layers and the units are groups of atoms, each containing 6 carbon, 10 hydrogen, and 5 oxygen atoms. Thus the probable empirical formula of starch is $C_6H_{10}O_5$. Studies of cellulose and pectin are being made. Suggestions as to the activity of protoplasm in depositing such substances as starch, cellulose, and pectin are given. Attention is called to the nature of the structure of such substances as these and the working of the laws of osmosis in organisms, and to problems in polarized light.—*O. L. Inman.*

1149. Thalhimer, William, and Margaret C. Perry. **Effect of plant extracts on blood sugar.** Science **58**: 120–121. 1923.—Intravenous injections of potato juice into a rabbit caused a falling off of blood sugar. This evidence, along with that from quite similar studies made by Winter and Smith and by Collip [see also Bot. Absts. 13, Entry 1135] on the preparation of insulin-like substances from plants, leads the writers to the tentative suggestion that insulin "indirectly stimulates or activates oxidizing ferments in the tissue cells to action upon glucose."—*C. J. Lyon.*

1150. Tobler, Friedrich, und Gertrud Tobler. **Farb- und Speicherstoffe in reifenden Ölpalmenfrüchten.** [**Pigments and storage materials in ripening palm oil fruits.**] Ber. Deutsch. Bot. Ges. **39**: 213–218. 1921.—An investigation was undertaken of fruits of different sizes and ages. The base, middle portion, and apex were investigated as to the content of starch, oil, carotin, and anthocyanin.—*F. M. Schertz.*

1151. Vahlen, E. **Über Metabolin und Antibolin aus Hefe.** [**Metabolin and antibolin of yeast.**] Zeitschr. Physiol. Chem. **106**: 133–177. 1919.—By use of the alcoholic chlorzinc method Vahlen has prepared a metabolin and antibolin from the cells of yeast which are similar to, but not identical with, those previously extracted from the pancreas of cattle. The metabolin accelerates alcoholic fermentation, while antibolin retards it. The substance are apparently isomers, being transformable one into the other by internal molecular rearrangement. A kind of metabolin which cannot be thus transformed has also been prepared from vegetable sources, yeast, and potatoes. This substance also hastens alcoholic fermentation, and gives some evidence of reducing the sugar content of the urine in diabetics.—*Chas. A. Shull.*

1152. Waentig, P., und W. Gierisch. **Über Celluloseverdauung in Vitro zum Zwecke der Feststellung der Verdaulichkeit zellulosehaltiger Futtermittel.** [**Cellulose digestion in vitro as a means of determining the digestibility of cellulose-containing foods.**] Zeitschr. Physiol. Chem. **107**: 213–224. 1919.—The caecal or colon fluids of the horse have power to digest sulphite cellulose or rye straw cellulose in variable amounts up to 37 per cent. But the untreated meal from pine wood was practically not unaffected. Fresh horse dung was found capable of digesting cellulose in small amounts, 1.6–8.9 per cent. The amout digested is much increased by addition of alkali.—*Chas. A. Shull.*

METABOLISM (NITROGEN RELATIONS)

1153. Adinarayan Rao, K. **A preliminary account of symbiotic nitrogen fixation in non-leguminous plants with special reference to Chomelia asiatica.** Agric. Jour. India **18**: 132–143. *Fig. 2.* 1923.—Two south Indian species—*Chomelia asiatica* and *Pavetta indica*—have been examined for leaf nodules. The nodules on the leaves of the former are caused by bac-

teria which are capable of fixing atmospheric nitrogen. These bacteria are very active and are found at all stages in the life history of the plant, which is unable to grow in their absence. —*A. Howard.*

1154. Finks, A. J., and Carl O. Johns. **Studies in nutrition. VI. The nutritive value of the proteins of the lima bean, Phaseolus lunatus.** Amer. Jour. Physiol. 56: 205–207. 1921.—Cooked lima beans with cystine added afforded satisfactory protein nutrition when fed to rats, while the uncooked beans were unsatisfactory.—*Ernest Shaw Reynolds.*

1155. Finks, A. J., and Carl O. Johns. **Studies in nutrition. VIII. The nutritive value of the proteins of tomato seed press cake.** Amer. Jour. Physiol. 56: 404–407. 1921.—This commercial product fed to rats gave satisfactory protein diet as well as furnishing water-soluble vitamin and possibly fat-soluble vitamin.—*Ernest Shaw Reynolds.*

1156. Hansen, R. **Symbiotic nitrogen fixation by leguminous plants with special reference to the bacteria concerned.** West. Canadian Soc. Agron. Proc. 1: 105–116. 1920.

1157. Hawk, Philip B., Clarence A. Smith, and Olaf Bergeim. **The nutritive value of yeast in bread.** Amer. Jour. Physiol. 56: 33–39. *Fig. 4–5.* 1921.—Bread made with 5 per cent of dried Fleishmann's yeast gave a markedly increased growth of rats as compared with rats fed on bread made with much less yeast. After feeding 2 weeks there was added to the diet of each group butter and inorganic salts. "The yeast supplements both the water-soluble B and protein content of wheat flour."—*Ernest Shaw Reynolds.*

1158. Iwanoff, N. N. **Über die Umwandlung des Harnstoffs beim Reifen der Fruchtkörper von Lycoperdon.** [Urea transformation during ripening of the fruiting body of Lycoperdon.] Biochem. Zeitschr. 135: 1–20. 1923.—Fruiting bodies of *Lycoperdon piriforme* and *L. saccatum* kept on filter paper at room temperature ripened and formed spores. During ripening trehalose disappeared and the nitrogen content increased from 7.12 to 8.74 per cent. Urea increased in the ripening fungi, but was absent from the spores at maturity. Urea was found to be in a labile combination which was resolved by treatment with hot water. It is thought to be produced from substances which yielded NH_3 on cooking with 10 per cent H_2SO_4 Urea formation was accompanied by vigorous respiration and the utilization of much oxidizable material. Urea is considered a reserve material.—*H. D. Hooker, Jr.*

1159. Johns, Carl O., and A. J. Finks. **Studies in nutrition. VII. The nutritive value of the proteins of the adsuki bean, Phaseolus angularis.** Amer. Jour. Physiol. 56: 208–212. 1921.—Raw as well as cooked adsuki beans were an adequate protein ration when cystine was added to the diet of rats, but not otherwise.—*Ernest Shaw Reynolds.*

1160. Kern, Alfred. **Über den im Rindenparenchym gespeicherten Eiweissstoff.** [The cortical storage of proteins.] Beih. Bot. Centralbl. I Abt. 40: 137–140. 1923.—The cortical tissues of *Betula alba, Salix, Acer, Alnus,* and *Quercus* were studied. Many cells in all of these contain strong light-refracting contents. These are what Naegeli called tannin particles. In many cells the caffeine shows the protein reaction. These substances are present in summer, but are much more plentiful in winter.—*L. Pace.*

1161. Murray, T. J. **Food accessory substances and the nitrite bacteria.** Proc. Soc. Exp. Biol. and Med. 20: 301–303. 1923.—Methods are given for growing "nitrite" bacteria. When vitamins are added to the synthetic solution, the "nitrite" bacteria were stimulated in growth, and larger amounts of nitrate formed. The writer feels that there may be a definite relation between food accessory substances and the "nitrite" organisms.—*M. M. Brooks.*

1162. Newton, W. **The rest period of Solanum tuberosum in relation to available nitrogen.** Science 58: 207–208. 1923.—Sand cultures of potatoes in the resting and non-resting conditions were used to study the effect of the presence and absence of nitrates in the nutrient solutions supplied. Those in the resting condition showed slow growth unless soluble nitrates were supplied. When the resting period was over, lack of nitrates was not in evidence. Apparently nitrates are formed by proteolytic activity within the tuber during the rest period.—*C. J. Lyon.*

1163. Northrup, John H. **Note on the purification and precipitation of casein.** Jour. Gen. Physiol. 5: 749–750. 1923.—Casein is generally prepared by precipitating it at its isoelectric point by the addition of an acid to an alkaline solution. The author describes a more desirable method whereby the final precipitation of the protein is effected with alkali, thus avoiding the presence of "denatured" casein.—*O. L. Inman.*

1164. Salkowski, E. **Zur Kenntnis der Eiweisskörper der Fäulnissbakterien.** [The proteins of putrefaction bacteria.] Zeitschr. Physiol. Chem. 109: 49–56. 1920.—Two proteins were isolated, an albumose and a globulin, both of which apparently contain no tryptophane, but do show some sulphur content by the Siegfried test. A delicate test for tryptophane, using formaldehyde, HCl, and 3 per cent iron chloride, is described.—*Charles A. Shull.*

1165. Steudel, H., und E. Peiser. **Über die Hefenucleinsäure.** [Nucleic acid of yeast.] Zeitschr. Physiol. Chem. 108: 42–49. 1919.—The authors call attention to a disagreement as to the composition of nucleic acid of yeast. Kowalevsky found guanin, adenin, cytosin, phosphoric acid, and ribose in the molecule, while Levene and Jacobs found uracil in addition. Starting with a sodium nucleate in which the P:N ratio is 1:1.77, they fractionally precipitated 5 different groups from it, in which the ratios of P:N were 1:2.09, 1:1,08, 1:1.58, 1:1.84, and 1:0.87 respectively. The first fraction analyzed out in accordance with the Kowalevsky formula, $C_{29}H_{42}O_{24}N_{13}P_3$, and the last fraction agrees with uridine-phosphoric acid. The latter contains uracil, which explains the fact that some have found uracil in nucleic acid. As the methods used produce no decomposition products, the original preparation is considered to have been a mixture. The results might be interpreted as favoring Thannhauser's view that yeast nucleic acid is a complex of 2 molecules of triphosphonucleic acid and 1 of uridinephosphoric acid, but there is nothing yet in the way of proof for this interpretation. [See also following entry.]—*Chas. A. Shull.*

1166. Thannhauser, S. J., und P. Sachs. **Über die Hefenucleinsäure.** [Yeast nucleic acid.] Zeitschr. Physiol. Chem. 109: 177–182. 1920.—A criticism of Steudel and Peiser's conclusions [see preceding entry] regarding nucleic acid is made. The authors claim that yeast nucleic acid is a tetranucleotide, composed of guanosine-, adenosine-, cytosine-, and uridine-phosphoric acids, joined through the oxygen-phosphorus linkages in the phosphoric acid. Uracil would then be a primary decomposition product of nucleic acid degradation. Structural formulae are suggested.—*Charles A. Shull.*

1167. Thomas, Pierre. **Recherches sur les protéiques de la levure.** [The proteins of yeast.] Ann. Inst. Pasteur 35: 43–95. 1921.—A new phospho-protein ("zymocaseine") and a true albumin ("cerevisiene"), in ratio of 1 to 3, are obtained from a water extract of macerated yeast passed through a Buchner filter. The former, insoluble in water and soluble in the alkalis and alkaline carbonates, is placed by its properties between casein and vitellin and contains 16.15 per cent N and 1.8 per cent P and approaches the aleurone and metachromatin bodies of grains. The latter, soluble in water and coagulable at a temperature of 41°C., contains 16.35 per cent N and about 0.90 per cent S and by its color reactions acts like protoplasmic materials. Chemical studies of these substances indicate their great importance in nutrition; and it is suggested that they represent some new types of compounds especially important in the filamentous fungi and bacteria.—*Ernest Shaw Reynolds.*

METABOLISM (ENZYMES, FERMENTATION)

1168. Bertrand, Gabriel et Arthur Compton. **Sur une curieuse modification de l'amygdalinase et de l'amygdalase due au vieillissement.** [Ageing of amygdalinase and of amygdalase.] Ann. Inst. Pasteur 35: 695–701. 1921.—These enzymes very slowly lose their activity with age, about $\frac{1}{3}$ in 10 years. At the same time they demand a changing optimal concentration of H ions from alkaline to acid as determined by phenolphthalein. This is rapid at first and comes to an end after some years. Concerning the mode of action of these enzymes in relation to this ageing process, it is suggested that in the author's theory the complementary activator is highly resistant to the action of H ions or the H ions act feebly toward the glucosides or both. Possible the ageing factor described is related to the complex problem of seed maturity.—*Ernest Shaw Reynolds.*

1169. Euler, Hans von, und S. Heintze. **Über die pH-Empfindlichkeit der Gärung einer Oberhefe.** [Sensitiveness of a top yeast fermentation to hydrogen-ion concentration.] Zeitschr. Physiol. Chem. 108: 165–185. *Fig. 1–3.* 1919.—The authors claim that in this paper for the 1st time the complete acidity-sensitiveness curve of top yeast fermentation is established. The rate of fermentation is determined by the volume of CO_2 produced in a given time

under controlled conditions. Using 4 hours, at 28°C., the CO_2 produced at pH 5 was 714 cc.; pH 2.5, 465 cc.; pH 1.5, 96 cc.; pH 1, 24 cc. The effects of acidity on the course of fermentation is greatly influenced by nutritive conditions. The presence of nitrogenous food or coenzyme activators (asparagine, or yeast extracts), greatly increases the volume of CO_2 produced. Above pH 7, the fermentation rate falls off rapidly. The curve shows a broad maximum at pH 5–7.—*Chas. A. Shull.*

1170. Euler, Hans von, und Ingvar Laurin. **Verstärkung der Katalasewirkung in Hefezellen.** [**Increasing the catalase activity of yeast cells.**] Zeitschr. Physiol. Chem. **106**: 312-316. 1919.—The effects of several reagents on the catalase activity of the yeast *Saccharomyces thermantitonum* have been determined. Chloroform increases the activity about 300 per cent, but increasing temperature does not effect an increase. Sunlight was found to decrease the catalase action, but X-rays do not affect it.—*Chas. A. Shull.*

1171. Euler, Hans von, und Olof Svanberg. **Saccharasegehalt und Saccharasebildung in der Hefe.** [**Invertase content and invertase formation in yeast.**] Zeitschr. Physiol. Chem. **106**: 201–248. *5 fig.* 1919.—The capacity of 2 strains of yeast to invert cane sugar has been tested from time to time for 2 and 8 years respectively, and has been found to be constant in each strain. The optimum temperature for development of invertase in the bottom yeast used was found to be 26–30°C. At a temperature of 35°C. or above there was apparently no invertase formation in this strain. The acidity of the medium is important in relation to invertase formation. The largest amount of secretion takes place at about the optimum acidity for invertase activity. When acidity exceeds pH 2 the invertase disappears, while at pH 6–7 the enzyme formation is about 90 per cent of its highest value. Washing the live yeast cells with tap water for several hours at 10°C. will not remove the invertase from the living protoplasm. —*Chas. A. Shull.*

1172. Euler, Hans von, und Olof Svanberg. **Versuche zur Darstellung hochaktiver Saccharasepräparate.** [**Methods of making highly active invertase preparations.**] Zeitschr. Physiol. Chem. **107**: 269–313. *1 fig.* 1919.—An account is given of methods by which invertase solutions which yield very active invertase preparations may be made. The best preparation secured had an activity of 3.5 minutes, which is 4–10 times as active as similar preparations made by other investigators. The nitrogen content of the enzyme after kaolin adsorption was 2.72 per cent. The maximum yield obtained is about $\frac{3}{500}$ of the original weight of fresh yeast used.—*Chas. A. Shull.*

1173. Fischer, Emil. **Einfluss der Struktur der B-glucoside auf die Wirkung des Emulsins.** [**Influence of the structure of the B-glucosides on the activity of emulsin.**] Zeitschr. Physiol. Chem. **107**: 176–202. 1919.—The effects of emulsin upon the various acids and acid derivaties of glucosides are summarized. Free acids are not attacked by small amounts of emulsin, probably because the H-ion concentration is too high. If the emulsin is greatly increased, certain acids are decomposed. Among the derivatives of the acids, the amides, esters, and nitriles undergo hydrolysis most readily. In the case of the nitriles not only is the sugar set free, but the -CN is also split off as HCN. The salts and amide of *d*-mandelic acid derivatives do not decompose, but those of *l*-mandelic acid do. Methods of preparing various glucosidic acids, esters, etc., as glucosido-*dl*-mandelic acid and its methyl ester are given, and the properties of the compounds discussed.—*Chas. A. Shull.*

1174. Funke, G. L. **Researches on the formation of diastase by Aspergillus niger van Tieghem.** Recueil Trav. Bot. Neerland. **19**: 217–275. *14 fig.* 1923.—[See Bot. Absts. 11, Entry 4665.]

1175. Hall, Ivan C. **The failure of fermentation reactions with Bacillus histolyticus.** Proc. Soc. Exp. Biol and Med. **20**: 503–504. 1923.—*Bacillus histolyticus* does not ferment glucose, levulose, maltose, lactose, saccharose, salicin, glycerin, or inulin. A table is given summarizing the differences between *B. histolyticus*, *B. tetani* and *B. putrificus*.—*M. M. Brooks.*

1176. Hepburn, Joseph Samuel. **Biochemical observations on certain insectivorous plants.** Jour. Franklin Inst. **194**: 771–781. *4 fig.* 1922.—A protease, active in 0.2 per cent HCl was detected in the liquor removed from unopened pitchers of *Nepenthes*, while negative results were obtained for catalase, urease, esterase, diastase, invertase, maltase, lactase, and emulsin. A substance, thought to be from nectar secreted by the leaf, which reduces the

Benedict alkalin solution was often found. Chlorides were discovered, but no phosphates or saponins. A protease, active in 0.2 per cent HCl was recognized in a composite sample of liquid gathered from leaves of *Dionaea muscipula*. An analysis of leaves from this plant is presented.—*Ernest Shaw Reynolds.*

1177. Maestrini, D. **Contributo alla conoscenza degli enzimi: IX. Sulla resistenza all' invecchiamento di alcuni enzimi dell'orzo germogliato.** [Enzymes: IX. The resistance of some enzymes of germinating barley to ageing.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 32[1]: 397–398. 1923.—Tests were made of the enzymes of germinating barley, using seed dried at 40°C. and also acidulated aqueous extracts, both of which had been kept for 3–4 years. Amylase and catalase did not appear to be perceptibly modified in their enzymatic activities, protease presented a much reduced hydrolytic capacity, while lipase, emulsin, and oxidase were destroyed in less than 2 years.—*F. M. Blodgett.*

1178. Palladin, W., und S. Manskaja. **Die Entstehung der Peroxydase in den Pflanzen. Die Bedingungen, welche die Abspaltung der Peroxidase von den Protoplasten ünd ihr Übergang in den Zellsaft hervorrufen.** [The origin of peroxidase in plants. The conditions that determine the cleavage of peroxidase from the protoplasts and its transfer to the cell sap.] Biochem. Zeitschr. 135: 142–157. 1923.—Peroxidases occur free in the cell sap and combined with the protoplast. Cytoplasm and nucleus of growing and resting organs gave color reactions for peroxidase in both plasmolysed living cells and in autolysed cells. These reactions were not given after prolonged treatment with alcohol. The peroxidase reaction with guaiac and hydrogen peroxide were given by the following: aleurone layer of wheat grains; gluten from wheat flour; lignified tissue of *Populus boleana*, of oak, and of *Iris*; the cuticle of *Clivia* leaves; and the cuticle and endodermis of *Iris* roots. Pure cell membranes of onion gave no reaction. After removal of all free peroxidase, combined peroxidase was found to be liberated during autolysis in chloroform water, and this liberation was favored by the presence of salts in the ascending order: NH_4Cl, NaCl, KNO_3, KI, ammonium oxalate, and ammonium citrate. The last 2 favored peroxidase liberation in only a few plants. The salt concentration was an important factor in peroxidase liberation, which was also increased by taka diastase. During autolysis of etiolated bean leaves, the quantity of peroxidase diminished,—a fact attributed to the oxidation of chromogen. Peroxidase liberation was prevented by a normal solution of sucrose. In plant tissues rich in chromogen, peroxidase was apparently protected from oxidation by chromogen in sucrose solution, as chromogen formation was prevented. The presence of a specific co-enzyme is considered essential for peroxidase activity. The applicability of Ehrlich's side chain theory to enzymes is discussed.—*H. D. Hooker, Jr.*

1179. Sherman, H. C., and Florence Walker. **Effect of amino acids in retarding the hydrolytic decomposition of an enzyme (pancreatic amylase).** Jour. Amer. Chem. Soc. 45: 1960–1964. 1923.—As was shown in a previous paper one function of the amino acids in these experiments was the protection they exerted on the enzyme. This is shown where the enzyme is allowed to act at a high temperature in the presence and in the absence of an amino acid. The raising of the temperature has 2 effects on the enzyme: (1) it increases its hydrolytic action, and (2) also increases the deterioration of the enzyme itself. The presence of the amino acid is to protect the enzyme from this deterioration. "The second action being retarded by the presence of one of its products (amino acids), the first effect, that is, increase in the rate of hydrolysis of the starch, becomes more noticeable."—*J. M. Brannon.*

1180. Soda, T. **Neue Beobachtungen über die Stimulation der alkoholischen Gärung durch chemisch definierte Körper.** [The stimulation of alcoholic fermentation by chemical compounds.] Biochem. Zeitschr. 135: 610–620. 1923.—Fermentation of glucose by the juice of macerated yeast cells was increased in the presence of trimethyl-amine oxide, allyl alcohol, cinnamic alcohol, α-crotonic acid, $\alpha\alpha$-diketopimelic acid, benzoylacetone and *o*-methylcyclohexanone.—*H. D. Hooker, Jr.*

1181. Svanberg, Olof. **Versuche zur Darstellung hochaktiver Saccharasepräparate. II.** [Preparation of highly active invertase. II.] Zeitschr. Physiol. Chem. 109: 65–98. *Fig. 1–3.* 1920.—These attempts to make highly active invertase preparations from yeast resulted in preparations not quite so active as described in a previous paper, but actually in a larger dry weight of enzyme.—*Charles A. Shull.*

METABOLISM (RESPIRATION, AERATION)

1182. Hall, Ivan C. **The aerobic cultivation of Bacillus histolyticus.** Proc. Soc. Exp. Biol. and Med. 20: 501–502. 1923.—*Bacillus histolyticus* was grown aerobically upon the surface of meat infusion and blood agar slants without reduction of oxygen pressure.—*M. M. Brooks.*

1183. Lieben, F. **Über das Verhalten von Brenztraubensäure und Acetaldehyd gegenüber mit Sauerstoff gelüfteter Hefe.** [The action of pyrotartaric acid and acetaldehyde toward yeast aerated with oxygen.] Biochem. Zeitschr. 135: 240–247. 1923.—Pyrotartaric acid shaken with yeast suspension in an oxygen stream was in part decomposed with the evolution of CO_2, and in part assimilated by the yeast even though no nitrogen was supplied. Pyrotartaric acid was reduced with zinc dust and HCl and the resulting lactic acid distilled and quantitatively determined. Acetaldehyde showed very slight CO_2 evolution and is, therefore, thought not to be an intermediate product of lactic acid or pyrotartaric acid decomposition.—*H. D. Hooker, Jr.*

1184. Lipschitz, Werner. **Mechanismus der Giftwirkung aromatischer Nitroverbindungen, zugleich ein Beitrag zum Atmungsproblem tierischer und pflanzlicher Zellen.** [Mechanism of toxicity of aromatic nitro-compounds, and the respiration problem of animal and plant cells.] Zeitschr. Physiol. Chem. 109: 189–259. *Fig. 1–3.* 1920.—The respiring cells are believed to bring about the endothermic reduction of such nitro-compounds as meta- or ortho-dinitrobenzene or dinitrotoluene, by removal of oxygen. As a result, nitrophenylhydroxylamines are formed, which, in contrast to the original nitro-compounds, are very powerful poisons, change hemoglobin to methemoglobin, and bring about morphological changes also in the blood. From this follows dyspnoea of the animal. Impairment of cell structure by grinding with sand, use of narcotics, high temperature, hypotonic salt solutions, arsenious acid, quinine, HCN, or removal of the respiration coenzymes by washing—anything that reduces respiration—hinders the production of the yellow nitrophenylhydroxylamines. The main work was done with muscle tissue. Other cells tested for their power to reduce nitro-compounds include yeast, yeast juice, beet seedlings, and the lungs, liver, kidneys, and gastric mucosa of rabbits. Some of the results obtained support the hypothesis that the coenzymes of respiration and fermentation are identical. Muscle inactivated by washing out the coenzymes recovers the reducing power by addition of boiled muscle or yeast juice. Under conditions excluding O_2, reduction of nitro-compounds is more rapid than in the presence of O_2 which indicates that the nitro-compounds act as H-acceptors for respiration under these conditions.—*Chas. A. Shull.*

1185. Ray, George B. **Comparative studies on respiration. XXVII. The mechanism of oxidation in relation to chloroform anesthesia.** Jour. Gen. Physiol. 5: 741–748. *Fig. 1–3.* 1923.—The author used the rate of CO_2 production as a quantitative criterion of the mechanism of oxidation taking place in the living cells of *Ulva*, killed *Ulva*, and unsaturated organic acids. It was found that a mathematical analysis could be made of the effects of chloroform upon the production of CO_2. The author thinks it reasonable to conclude that the chief reaction of chloroform and perhaps of other narcotics upon the oxidation within the cell is of a chemical nature and that the chloroform acts either as a catalyst or by the formation of loose compounds with some other portion of the reacting system.—*O. L. Inman.*

1186. Waksman, Selman A., and Robert L. Starkey. **Carbon assimilation and respiration of autotrophic bacteria.** Proc. Soc. Exp. Biol. and Med. 20: 9–14. 1922.—Methods for cultivating the autotrophic sulphur-oxidizing organism *Sulfomonas thiooxidans* are described. The method of Meyerhof was used for estimating the rate of respiration. The effect upon the rate of respiration of a number of substances is given.—*M. M. Brooks.*

ORGANISM AS A WHOLE

1187. Benton, A. G. **Some observations on pellicle formation.** Proc. Soc. Exp. Biol. and Med. 20: 513–514. 1923.—*Bacillus subtilis* was grown in ordinary broth and observations made every hour (for 36 hours) on morphology, progress of growth, spore formation, buoyancy of the pellicle, and surface tension of the medium. The upper surface of the pellicle is not wetted by water. Experiments are under way to determine whether this is due to an accumulation of old cells storing lipoids in the upper layers.—*M. M. Brooks.*

1188. Branscheidt, Paul. **Zur Anatomie und Entwicklungsgeschichte von Chaerophyllum aureum L., insbesondere seiner Achsengelenke.** [The anatomy and development of Chaerophyllum aureum, especially the nodes.] Beih. Bot. Centralbl. I Abt. 40: 14–136. 1923.—Table 1 shows date of each collection of material from Apr. to Aug., giving the state of development of the plants, also the tissues and substances tested for. Other tables compare different parts of the stem as to size of cross section, the distribution of libriform or wood fibers, the number of cell layers, of pith rays, bundles, etc.—The internodes are green; the nodes are without chlorophyll, or the latter is not typical. Anthocyanin is at its maximum in the 3rd internode and it is first found in flecks at the beginning of the flowering period (May 17, 1920). Later it is diffused, appearing in larger quantity in June, but disappearing after July 19. Pigment production is greatest on the sunny side of the plant. Oxalate was not observed in the tissues. The maximum quantity of nitrate is in the pith of the 3rd and 4th internodes, and appears later than the precipitate with potassium bichromate, but probably somewhat earlier than the sugar maximum.—Graphs show that in both internode and joint, the tannins in pith, primary and secondary wood of the bundle are more plentiful in May, decreasing rapidly about June 1. Starch reaches its maximum June 23.—The relation of anatomical differentiation and the presence of starch, sugar, the precipitate with potassium bichromate, tannins, and chlorophyll are discussed.—*L. Pace.*

1189. Gouwens, Willis E. **Acid agglutination of paratyphoid bacilli.** Jour. Infect. Diseases 33: 113–123. 1923.—The acid agglutination of 59 cultures of paratyphoid bacilli was studied. Under like conditions different strains of a given species had different optimum H-ion concentrations for acid agglutination. Organisms of the paratyphoid group could not be differentiated on the basis of acid agglutination because the zone over which agglutination extends for all strains of 1 species overlaps that of all the other species. The age of the culture did not appreciably affect acid agglutination. Washing the cells greatly reduced the capacity for acid agglutination while grinding increased it. Differences in the composition of the medium had little influence on the optimum pH for acid agglutination of *B. paratyphosus B* but exerted more influence on *B. abortus-equinus*. Normal horse serum agglutinated all acid inagglutinable suspensions. Repeated transfers did not alter the capacity for agglutination. —*R. L. Starkey.*

1190. Nishiguchi, H. **Über ein Phänomen bei der Agglutination von Typhusbazillen in salzarmen Medium.** [A phenomenon accompanying agglutination of typhus bacilli in a medium poor in salt.] Biochem. Zeitschr. 135: 165–173. 1923.—When 0.85 per cent NaCl was used as diluent, agglutination of typhus bacilli occurred at dilutions ranging from 1:10 to 1:20,000 or 1:50,000. When distilled water was used as diluent, the usual agglutination occurred except at dilutions of 1:200 and 1:500.—*H. D. Hooker, Jr.*

1191. Patschovsky, Norbert. **Zur Ernährungs- und Entwicklungsphysiologie von Chara fragilis Desv.** [The nutrition and physiological development of Chara fragilis.] Ber. Deutsch. Bot. Ges. 37: 404–411. 1919.—The writer determines the effects of 5 nutrient solutions, each in several different concentrations, in light and darkness upon *Chara fragilis*. Similar concentrations of different solutions did not produce similar growths. Plants in darkness in a 1.1 per cent concentration of a 2 per cent $Ca(NO_3)_2$, 0.1 per cent K_2HPO_4, 0.1 per cent $MgSO_4$, and Fe_2Cl_6 solution showed the usual geotropic response, developed long white internodes, produced chlorophyll-green "leaf" whorls, and the cultures were free of algal growths.—In the higher concentrations, for example, in 8 per cent Knop's solution, rhizoid formation ceased.—In tap water the plants bore antheridia and oogonia. Gametangia were not formed in any of the nutrient solutions, although vegetative growth continued except in some solutions fatal to the plants.—*L. H. Tiffany.*

1192. Perotti, R., e G. Zaffuto. **Sui bacilli radicali della Calenlendula [Calendula] officinalis L.** [The root bacteria of Calendula officinalis.] Atti. R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 32[1]: 94–98. 1923.—Details of cultural studies are given of various bacteria said to be normally present in the roots of *Calendula officinalis*.—*F. M. Blodgett.*

1193. Pinoy, P. E. **Sur les myxobactéries.** [The Myxobacteriales.] Ann. Inst. Pasteur 35: 487–495. *5 fig.* 1921.—The successful cultivation of *Chondromyces crocatus* is dependent upon growing it in association with a particular *Micrococcus* related to *M. luteus*. The char-

acteristics of *Chondromyces* are similar to those of the legume bacteria, notably in the possession of the following: Y forms of the bacteroids; filamentous forms covered with a substance resembling in chemical properties the investing material of the legume bacteria in the nodules; and, finally, cysts which resemble the cell-penetrating infection strand of the legume forms. —*Ernest Shaw Reynolds.*

1194. Violle, H. **Les microbes du lait. Une espèce banale de ferment lactique très fréquente dans le lait: Le streptocoque lactique glaireux.** [The glairy lactic Streptococcus.] Ann. Inst. Pasteur 35: 218–229. *2 fig.* 1921.—There are given the etiology, morphology, and cultural characteristics, together with the biological and physiological reactions of a Streptococcus found commonly in milk. It produces in sugary media a glairy substance and lactic acid. It seems to have no pathological significance except that when inoculated into beets, the tissues immediately surrounding the point of inoculation become a viscid, gummy mass. —*Ernest Shaw Reynolds.*

1195. Zellner, Julius. **Die symbiose der Pflanzen als chemisches Problem. II Teil.** [Symbiosis of plants as a chemical problem. Part 2.] Beih. Bot. Centralbl. I Abt. 40: 1-13. 1923.—The literature on the chemistry of the phanerogams which are poor in chlorophyll is reviewed. This list shows no parasites in the monocotyledons and in this group there are saprophytes only in 3 closely related families, namely, Burmanniaceae, Orchidaceae, and Treuridaceae. In the dicotyledons the parasites are in 2 groups: (1) the Balanophoraceae, Rafflesiaceae, Hydnoraceae, Lennoaceae, Cynomoriaceae, Santalaceae, Myzodendraceae, and Loranthaceae; (2) the Scrophulariaceae and the Orobanchaceae. The remaining individual genera are in 5 orders. Out of the phanerogams (about 130,000 species) there are about 345 without chlorophyll and about 1,030 green parasites and partial parasites. The fungi, and the phanerogams which are poor in chlorophyll, agree in lack of mechanical tissue and in increased water content.—No difference in food requirements of saprophytic and parasitic fungi has been determined; the same is true for phanerogams. These all need a supply of organic food. So far as can be judged, they require only sugar or other carbohydrate, as they are able to manufacture the nitrogenous substances. In this they approach animal nutrition. In fact, certain animal products, as urea, chitin, etc., are found in fungi. It has been suggested that this is a result of parasitism. If this is true, these substances should be found in parasitic phanerogams. *Neottia nidus avis, Monotropa Hypopipys, Cuscuta europea, Lathraea squamaria, Orobanche gracilis,* and *O. mutile* with *Viscum album* from the green group were investigated. The result was that no similarity with the fungi or the animal was established. This suggests that the presence of urea, chitin, etc., may not be a result of the parasitic habit. It might be referred to their systematic position, which is considered to be on the border of the plant and animal kingdoms.—The symbiosis of plants is so complicated that studies of the anatomy, physiology, and chemistry should be carried on together.—*L. Pace.*

GROWTH, DEVELOPMENT, REPRODUCTION

1196. Derby, K. G. **La concentration optima en ions hydrogène favorisant le développement de certains micro-organismes.** [Optimal concentration of hydrogen ions for certain microorganisms.] Ann. Inst. Pasteur 35: 277–290. *4 fig.* 1921.—Two classes of bacteria related to the concentration of H ions are recognizable in about 40 kinds studied, those allowing wide variation of acidity and those requiring a very restricted range. The latter included many important pathogens.—*Ernest Shaw Reynolds.*

1197. Dowling, J. J. **The recording ultramicrometer: its principle and application.** London, Edinburgh and Dublin Phil. Mag. 46: 81–100. *9 fig.* 1923.—An electrical oscillating valve circuit is used as an ultramicrometer. Details of construction and standardization are given. An elongation of 2×10^{-6} cm. per cm. can be measured on a length of 2 cm. When applied to the study of plant growth, growth pulses in the root tip of *Vicia Faba* were recorded, thus confirming Bose's observations. At each pulsation the root elongated about 1×10^{-3} cm.; this was followed by a smaller contraction. About 100 seconds were required to reach the maximum elongation of each pulse, and about 200 for the complete pulse.—*W. R. G. Atkins.*

1198. Fulmer, Ellis I., and Victor E. Nelson. **Studies on yeast. VI. On the continuous growth of Saccharomyces cerevisiae in synthetic mediums.** Jour. Infect. Diseases 33: 130–133. 1923.—Yeast has been grown continuously for 39 months in 3 synthetic media. The failure of others to duplicate the results are discussed.—*R. L. Starkey.*

1199. Funk, Casimir, and Louis Freedman. **Can yeast grow in a chemically pure medium?** Proc. Soc. Exp. Biol. and Med. 20: 311–313. 1923.—The strain of baker's yeast used is unable to grow without vitamin D and hence is unable to synthesize vitamin B in the absence of vitamin D.—*M. M. Brooks.*

1200. Gericke, W. F. **Further notes on effect of extent of root systems on tillering of wheat.** Bot. Gaz. 75: 320–322. 1923.—Supplementing the work of a previous paper [see Bot. Absts. 12, Entry 1476] the author presents the results of a root-cutting experiment in which wheat plants of the same age were used. Wheat plants in water culture with roots 50–60 cm. long were divided into 3 sets: (1) roots uncut; (2) roots cut back to 30 cm.; (3) roots cut back to 4 cm. The following were the average numbers of tillers obtained: (1) 20; (2) 16.7; (3) 11.2. The author draws the conclusion that a difference in root absorbing capacity is causally related to tillering.—*B. W. Wells.*

1201. Lumière, Auguste. **Influence des vitamines et des auximones sur la croissance des végétaux. [The influence of vitamines and of auximones on the growth of plants.]** Ann. Inst. Pasteur 35: 102–123. *Fig. 1–8.* 1921.—Several fungi were grown in cultures on media containing an infusion of dried raisins or a yeast extract, which are naturally high in vitamins, and in check cultures having no source of vitamin. Some of the media were autoclaved and some passed through a bougie filter. The fungi grew better on the autoclaved media than either the check or the filtered extracts. Carbonized extracts of dried raisins and of yeast added to culture media gave noticeably better growths than the check without either of these added. Carbonized yeast extract gave better results than extract of dried raisins. Phosphotungstic acid precipitates of these extracts when treated with baryta and added to media gave poorer growths than the filtrate from these precipitates, although the former should have the vitamin fraction present. Raulin's and Winogradsky's media were used for these latter experiments. The liquids obtained from antiscorbutic fluids passed through Fullers' earth or hydrated aluminum silicate lack the antiscorbutic power but still stimulate growth of the fungi tested, even more than the unfiltered fluids. These various experiments suggest that the vitamins are not only not necessary for plant growth but actually injurious in the higher concentrations, due possibly to their alkaloidal constitution, as suggested by Funk. The benefit to plants attributed to vitamins is here considered to be due to accompanying substances, possibly of mineral nature.—*Ernest Shaw Reynolds.*

1202. Lund, E. J. **Electrical control of polarity in an egg.** Proc. Soc. Exp. Biol. and Med. 20: 113. 1922.—The eggs of *Fucus inflatus* were placed on cover glasses at the bottom of a special glass trough, through which flowed fresh sea water and an electric current. Perfect orientation and normal growth occurs only within a relatively narrow range of electrical potential which lies around 0.025 volts.—*M. M. Brooks.*

1203. Marshall, Francis Hugh Adam. **The physiology of reproduction.** 2nd rev. ed., *xvi+770 p. Illus.* Longmans, Green, and Co.: London and New York, 1922.—Contains contributions also from William Cramer, James Lochhead, and Creswell Shearer.—*B. M. Duggar.*

1204. Svanberg, Olof. **Über die Wachstumsgeschwindigkeit der Milchsäurebakterien bei verschiedenen H-Koncentrationen. [Growth rate of lactic acid bacteria at various H-ion concentrations.]** Zeitschr. Physiol. Chem. 108: 120–146. *Fig. 1–4.* 1919.—Several races of lactic acid bacteria, grown under constant phosphate concentrations but at different H-ion concentrations, were used. *Streptococcus lactis* has an optimum growth at pH 5.5–6.4 at 24°C.; *Bacterium casei* and *B. delbrücki* have a long optimum region between pH 5 and 6. The relation of these forms to the *B. coli-aerogenes* group of bacteria, with growth limits of pH 4.3–10, is discussed.—*Chas. A. Shull.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

1205. Hendricks, H. V. **Torsion studies in twining plants II.** Bot. Gaz. 75: 282–297. *Fig. 1–10.* 1923.—The same modified auxanometer together with certain formulae such as the "coefficient of rigidity," are used, as were presented in the author's early paper [see Bot. Absts. 8, Entry 1494]. In the present study, *Humulus Lupulus* and *Ipomoea purpurea* are found to obey the same general rules which governed the flowering bean (*Phaseolus multiflorus*)

and bindweed, (*Tiniaria Convolvulus*) of the first paper. The completion of growth in length and torsion, followed by a slight reverse twist, occurs successively and gradually from the proximal to the distal end of the internode. The reverse in torsion, the writer suggests, may be due to lignification. With regard to rigidity, it was found that the lower part of the internode reaches its sudden increase before the middle part, and this last before the upper part. Increase in diameter is practically proportional to increase in length of internode. In comparing the twist with the diameter, the results showed that there is a tendency for the final twist per cm. to vary inversely with the final average diameter. Observations on coiling were also made among which may be noted the fact that coiling, after disappearing from the lower part of an internode, appeared in the upper region, indicating an upward advance of the various processes involved.—Treated mathematically certain relations express a parabola, but the author finds "after careful inspection and comparison of all the curves, it appears probable that to most of the experimental data, the parabola does not apply."—*B. W. Wells.*

GERMINATION, RENEWAL OF ACTIVITY

1206. Hausdörfer, H. **Der Einfluss der künstlichen Trocknung mittels vorgetrockneter Luft auf die Keimfähigkeit von durch Beizung aufgequollenen Getreidekörnen. [The influence of a treatment with dry air upon the germination of cereal grains swelled by corrosion.]** Landw. Jahrb. 58: 691–709. 1923.—Corroded grains are not injured in respect to germination capacity by dry air but rather favorably affected.—*S. A. Waksman.*

1207. Shull, Charles A., and Ward B. Davis. **Delayed germination and catalase activity in Xanthium.** Bot. Gaz. 75: 268–281. 1923.—The well known difference in germination behavior between the upper and lower seed of the Xanthium fruit is shown in this paper to be correlated with catalase activity. The delayed germination of the upper ones is constantly related to less catalase activity per unit of dry substance as contrasted with that of the earlier germinating lower seed. The authors state that the catalase activity of the dried, stored seed is relatively stable for several months. During germination, field material uniformly showed increase in catalase activity in the lower seed while the upper ones lagged behind, showing practically no increase. "Long delay of germination while in the germinators leads first to increased catalase activity of uppers followed by a decline, which at the end of several months leaves the seeds with no more activity than air-dry seeds. The decreased catalase activity accompanies a decreased vigor of germination. The catalase differences in Xanthium seeds are in harmony with other physiological differences which cooperate to bring about delayed germination of upper seeds with intact coats." The writers take occasion in this paper to interpret the data of McHargue [see Bot. Absts. 12, Entry 1491] who claims he was unable to demonstrate germination differences in the 2 seeds of the Xanthium fruit.—*B. W. Wells.*

TEMPERATURE RELATIONS

1208. Bertrand, Gabriel, et Arthur Compton. **Influence de la température sur l'activité de la salicinase. [The influence of temperature on salicinase.]** Ann. Inst. Pasteur 35: 702–712. 1921.—The action of salicinase found in almonds in addition to amygdalase and amygdalinase was studied in various concentrations of the enzyme and of salicin at various temperatures for varying lengths of time. The concentration of the substances did not affect the optimum or maximum points but the temperature and length of time did. The optimum varied from 55°C. for 1 hour to about 30°C. for 32 hours or more. The maximum, or point where activity ceased, varied from 69°C. for 1 hour to 54°C. for 69 hours. At 27°C. salicinase preserved $\frac{9}{10}$ of its activity at the end of 23 days in water with a little toluene added, while at 36°C. it was almost completely destroyed. It is concluded that the use of optima for separating enzymes is not justified. "The maximum temperature of activity" is the point of immediate destruction of the enzyme. The point of greatest activity may not be the most efficient point since at a high temperature it may take longer to hydrolyze the amount of material available than the time that the enzyme can endure that temperature before complete destruction.—*Ernest Shaw Reynolds.*

1209. Dhar, Nilratan. **Temperature coefficients of reactions in tropical sunlight.** Jour. Chem. Soc. [London] 123: 1856–1861. 1923.—Evidence is cited against the generally held opinion that the temperature coefficient of photochemical reactions should be about 1.0. It may have any value, but if light accelerates the reaction, the temperature coefficient will be higher in the dark than in the light. Thus, a chemical reaction is cited in which the coefficient for 10° rise was 7.2 in the dark and 2.68 in tropical sunlight. Reactions very sensitive to temperature are also sensitive to light.—*F. E. Denny.*

1210. Euler, Hans von, und I. Laurin. **Über die Temperaturempfindlichkeit der Saccharase (Invertase).** [Sensitiveness of invertase to temperature.] Zeitschr. Physiol. Chem. 108: 64–114. *Fig. 1–4.* 1919.—The temperature coefficient for inversion by a top yeast was determined at pH 4.5. Between 0 and 20°C. the value of A in the Arrhenius temperature formula was found to be 10500 ± 500; and from 20 to 52°C., 8800 ± 400. Inactivation of invertase does not proceed according to the monomolecular reaction formula. Using a certain strain of top yeast, at optimum acidity, and at a temperature of 59°C. for 1 hour, the activity of the enzyme was reduced 50 per cent. With a constant acidity of pH 4.5, the constant A attains a value of 101000 ± 3000 when applied to temperature inactivation of invertase. The minimal temperature sensitiveness lies at pH 4–5, at the optimum acidity for inversion; and the value A is largest in this same region of acidity.—Bottom yeast invertase is somewhat less sensitive than that of top yeast, requiring a temperature about 2° higher for the same time interval to produce the same proportional loss in inversion activity. The temperature constant has the same value for both kinds of yeast. Isolated invertase differs little from that in the yeast cell. The cell exerts a slight protection, equivalent to about 1°C. The constant A is somewhat larger for inactivation of extracted invertase than for that in the living cell. The slightly greater stability of the invertase of bottom yeast is not due to protective substances in the yeast cell that retard inactivation, for the juice of bottom yeast heated to 60°C. and added to top yeast does not increase the stability of the top yeast invertase. —*Chas. A. Shull.*

RADIANT ENERGY RELATIONS

1211. De Fazi, Romolo. **Azione die raggi ultravioletti nella fermentazione alcoholica da Botrytis cinerea.** [Action of untraviolet rays on alcoholic fermentation by Botrytis cinerea.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 32¹: 235–236. 1923.—In sterilized grape must inoculated with must that had been exposed for 6 hours to a quartz mercury vapor lamp the sugar was converted into alcohol more rapidly than in a 2nd lot of sterilized must inoculated with must not exposed to the mercury vapor lamp.—*F. M. Blodgett.*

1212. Tanner, Fred W., and Earl Ryder. **Action of ultraviolet light on yeast-like fungi. II.** Bot. Gaz. 75: 309–317. 1923.—Twenty species of yeast were exposed to ultraviolet rays from a 1,200 candle-power Cooper-Hewitt lamp with the result that the destruction period was found to vary from 1.5 minutes in the case of such unpigmented yeasts as Champagne yeast to 20 minutes with a certain pigmented yeast from oysters. Most of the species were destroyed with an exposure less than 10 minutes. Tests were also made on bacterial resistance, with the result that bacteria were found to disappear in slightly less time than the yeasts, but this difference as shown in combination cultures of bacteria and yeast was not great enough to give any credence to the statement of Fazi that ultraviolet light increased the fermenting power of yeast through the elimination of contaminating bacteria. Throughout the course of their work, the authors found that resistance is directly proportional to cell size.—*B. W. Wells.*

1213. Tchahotine, Serge. **Sur le méchanisme de l'action des rayon ultraviolets sur la cellule.** [Action of ultraviolet rays on the cell.] Ann. Inst. Pasteur 35: 321–325. 1923.—It is concluded that the colloids of the protoplasmic membrane of sea urchin eggs were coagulated under the influence of ultraviolet rays, thus increasing permeability. The consequent increase in salts leads to precipitation of the colloids enclosing colloidal lecithin. Those becoming freed coagulate to form a hyalin mass, which on decomposition gives rise to a base ("choline?"). The OH ions cause swelling through inhibition of the colloids, and complete disorganization takes place.—*Ernest Shaw Reynolds.*

TOXIC AGENTS

1214. Buchmann, Freda M. **Effect of spices on growth of Clostridium botulinum.** Jour. Infect. Diseases 33: 236–239. 1923.—*Clostridium botulinum* grew readily in mincemeat and in meat containing as high as 2 per cent of various spices with no inhibition to toxin formation. Growth was retarded in the presence of 2.5 per cent of some spices.—*R. L. Starkey.*

1215. Hill, Justina H., and David I. Macht. **A note on the antiseptic properties of olive oil.** Proc. Soc. Exp. Biol. and Med. 20: 170–171. 1922.—Olive oil was found to have an antiseptic property not exhibited by cotton-seed oil, albolene, oil of almonds, or peach kernel oil when *Staphylococcus pyogenes aureus* was used.—*M. M. Brooks.*

1216. Hishikawa, T. **Über die Bestimmung zell- und keimschädigender Substanzen auf biologischem Wege. III. Chinin.** [Biological determination of substances toxic to cells. Quinine.] Biochem. Zeitschr. 135: 576–580. 1923.—One part of quinine hydrochloride in 320,000 parts of solution inhibited the decolorization of methylene blue by suitable strains of Pneumococci. Less sensitive strains were affected by 1 part in 40,000 or 80,000. Previous cooling in a refrigerator increased the sensitivity so that the presence of 1 part in several million could be detected.—*H D. Hooker, Jr.*

1217. Lund, E. J., and Vesta Holt. **The action of potassium cyanide on the chlorophyll mechanism of Nereocystis.** Proc. Soc. Exp. Biol. and Med. 20: 232–233. 1923.—Potassium cyanide (0.00008 mol.) can produce an apparently complete but reversible inhibition of photosynthesis. Injury occurs in proportion to the concentration of cyanide. Solutions of cyanide in sea water (about 0.0006 mol.) which produce permanent injury in light do not produce injury when the plant material is placed in darkness.—*M. M. Brooks.*

1218. Macht, David I. **A phyto-pharmacological study of some isomers.** Proc. Soc. Exp. Biol. and Med. 20: 35. 1922.—The influence of a number of isomeric drugs was studied on the roots of *Lupinus albus.*—*M. M. Brooks.*

MISCELLANEOUS

1219. Cohen, Barnett. **Brom cresol green, a sulfonphthalein substitute for methyl red.** Proc. Soc. Exp. Biol. and Med. 20: 124–125. 1922.—A sulfonphthaline indicator whose dissociation constant is almost identical with that of methyl red has been synthesized. It is superior to methyl red because the color standards are unaffected after several months' exposure.—*M. M. Brooks.*

1220. Legroux, René. **Tubes plats pour separation et culture massive des microbes.** [Flat sided tubes for separation and solid culture of microbes.] Ann. Inst. Pasteur 35: 231–236. *4 fig.* 1921.—Long tubes with one flat side are described, and their manipulation in obtaining pure cultures, in place of Petri dishes, is given. It is claimed that they combine the advantages of the dishes with other desirable features which the latter do not have and at a lower cost of manufacture.—*Ernest Shaw Reynolds.*

1221. Lockemann, Georg. **Ein Messhahntrichter für die Säuregemischveraschung nach Neumann.** [A graduated dropping funnel for ashing with mixed acids according to Neumann.] Zeitschr. Physiol. Chem. 107: 211–212. *1 fig.* 1919.—The dropping funnel here described is graduated so that the amount of acid needed can be read off without previous measuring. A bent stem gives space for other operations while running in the acid.—*Chas. A. Shull.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 629, 640, 643, 659, 660, 665, 666, 674, 684, 687, 688, 691, 697, 701, 703, 959, 1120, 1126, 1153, 1156, 1162)

1222. Aarnio, B. **Om Sjömalmerna.** [On the formation of bottom deposits in the inland lakes of South Finland.] Fennia. Soc. Géog. Finlande 41[4]: 1–77. 1921.—These deposits are formed in lakes in the neighborhood where porous sandy soils predominate and are typically

humus podsol. They originate on the bottom, where the soil water comes out, not through the action of any organism but as the result of coagulation around a mineral nucleus. They are composed mainly of iron oxide, with smaller amounts of humus and insoluble mineral matter, such as manganese oxide and minute amounts of phosphate.—*W. R. G. Atkins.*

1223. Adinarayan Rao, K. **A new source of manure.** Agric. Jour. India 17: 476–482. 1922.—Megasse was subjected to the action of various nitrogen-fixing organisms for 2 months during which time the percentage of nitrogen rose from 0.27 to 1.39. The loss in bulk was not determined so that the absolute gain in nitrogen cannot be stated.—*A. Howard.*

1224. Carleton, E. A. **The acidity of the soil from the viewpoint of its concentration of hydrogen-ion.** Sci. Agric. 3: 412–414. 1923.—The author introduces the subject with a short explanation of the meaning of H-ion concentration, a definition of the symbol pH, and mentions the methods employed in determining the H-ion concentration. Soils from various parts of the province of Quebec have pH values ranging from 4.8 to 7.6 High H-ion concentration has the effect of increasing the solubility of certain toxic materials in the soil. The relation of soil organisms to the pH value of the soil is briefly discussed. A soil analysis from the point of view of H-ion concentration and liming is important.—*T. G. Major.*

1225. Clarke, G., S. C. Bannerjee, M. Naib Husain, and Abdul Qayum. **Nitrate fluctuation in the Gangetic Alluvium and some aspects of the nitrogen problem in India.** Agric. Jour. India 17: 463–475. *Pl. 27–28.* 1922.—The nitric nitrogen in the upper 2 feet of the soil of fallow land at Cawnpore was determined separately at intervals from Sept., 1919, to Apr., 1920, by mean of Schloesing's method as described by Warrington. After the end of the rains in October, there was a rapid rise of nitric nitrogen in the 1st foot of soil, while in the 2nd foot the increase was only slight. This formation of nitrates corresponds with the requirements of the cold weather crops. The system of agriculture at present practised in Northern India has reached a position of equilibrium in which the nitrogen removed by the small crops produced and the losses of nitrate by leaching and denitrification during the rains are balanced by the recuperative agencies which add nitrogen to the soil. Experiments carried out by the authors at the Sugar Cane Experiment Station at Shahjahanpur show that by the addition of organic matter (containing 100 pounds of nitrogen to the acre) crop production can be doubled provided a suitable rotation, improved varieties, and simple agricultural improvements are adopted.—*A. Howard.*

1226. Clevenger, C. B. **On soil fertility.** Sci. Agric. 3: 272–275. 1923.—The need for maintaining soil fertility and the means by which this may be done are popularly discussed. The chemistry and biology of soils under crop conditions is taken up in a general way.—*T. G. Major.*

1227. De Long, W. A. **Sulphur and soil acidity.** Sci. Agric. 3: 354–356. 1923.—This gives the results of experimental work to determine the effect upon the growth of the scab organism, in soil known to be infested with it, of sulphur in the following amounts: 300, 400, 500, and 600 pounds per acre. The applications were made 4 weeks before, at, and 4 weeks after planting, using both inoculated sulphur and flowers of sulphur. The amount of acidity increased in proportion to the sulphur applied up to 500 pounds, after which the increase was not proportionate. There was no difference in the amount of acidity produced by the 2 forms of sulphur.—*T. G. Major.*

1228. Frosterus, Benj. **Om Jordmånsforskning.** [Soil investigations.] Fennia. Bull. Soc. Géog. Finlande 40^5: 1–22. 1918.—An historical and general discussion of soil types is given. The soils of Finland owe their character mainly to the climate. Leaching processes have modified the primary soils, so that they are now thoroughly extracted (Podsolböden). Ground water rich in electrolytes may be an important factor in certain soils.—*W. R. G. Atkins.*

1229. Howard, A., and G. L. C. Howard. **A preliminary note on the theory of phosphatic depletion in the soils of Bihar.** Agric. Jour. India 18: 148–154. 1923.—A number of experiments are described, the results of which do not accord with the view that phosphatic manures are necessary in the soils of North Bihar. Java indigo has been grown continuously for 4 years in the same soil in a lysimeter without the addition of phosphate and no evidence of arrest of growth due to lack of phosphorus has been observed. Reducing the amount of phos-

phate by replacing the soil with 30 per cent potsherds increased the growth of indigo by nearly 50 per cent. The occasional beneficial effect of superphosphate on Bihar soils is considered to be due to the effect of this substance on the physical texture of the soil. Superphosphate rapidly reverts to insoluble tricalcium phosphate when added to the highly calcareous soils of North Bihar and the manure thus acts as a weak acid. It might, therefore, easily affect the soil colloids. If the acton is due to this cause, other dilute acids should have a similar effect. Accordingly, experiments were carried out on Pusa soil with superphosphate, sulphur and dilute sulphuric acie in equivalent amounts, the crop grown being cotton. The best results were obtained with sulphur, the poorest with superphosphate.—*A. Howard.*

1230. Plymen, F. J., and D. V. Bal. **The relative nitrifiability of different nitrogenous organic manures in some typical soils of the Central Provinces and Berar.** Agric. Jour. India **17**: 551–559. 1922.—The response to nitrification of some common organic manures was determined in the case of 5 tropical soils widely distributed over the Central Provinces and Berar. The nitrogen in mahua (*Bassia latifolia*) cake was not nitrified to any appreciable extent during a period of 8 weeks in any of the soils under experiment.—*A. Howard.*

1231. Pope, Harold B. **Nauru and Ocean Island. Progress under government ownership.** Jour. Dept. Agric. Victoria **20**: 129–135. *3 fig.* 1922.—The amount of phosphate shipped in 1921 was 554,656 tons, distributed as follows: to Australia 357,496; to United Kingdom, 32,300; to New Zealand, 29,750, to other countries, 135,110. A plan is outlined for the installation of machinery loading 7,000–8,000 tons in 24 hours, irrespective of weather.—*Wm. E. Lawrence.*

1232. Scott, P. Rankin. **Artificial fertilizers. List of fertilizers registered under the Fertilizers Act for the year 1922.** Jour. Dept. Agric. Victoria **20**: 45–54. 1922.

1233. Shepherd, A. N. **Soil improvement on Yanco irrigation area.** Agric. Gaz. New South Wales **34**: 593–594. *1 fig.* 1923.—Lack of humus renders irrigation and cultivation difficult in the heavy clay soils of the Murrumbidgee areas. Conditions have been improved where gypsum has been applied at the rate of about 1 ton per acre.—*L. R. Waldron.*

1234. Witteveen, Ir. H. J. **Over de bemesting met kalihoudende kunstmeststoffen op zand- en veengronden.** [Potash manuring on sand and muck soils.] Cultura **35**: 165–176. 1923.—A review is given of the work of W. Schneidewind and Wagner.—*J. C. Th. Uphof.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 704, 764, 786, 835, 859, 882, 901, 1092)

GENERAL

1235. Abrams, LeRoy. **An illustrated flora of the Pacific States, Washington, Oregon, and California.** *xi + 557 p., 1299 fig.* Stanford University Press, 1923.—This is the 1st volume of a projected work in 3 volumes designed to describe and illustrate all the species of pteridophytes and spermatophytes known to grow without cultivation in the 3 states. The sequence of families is that of Engler; the present volume begins with the ferns and ends with the Aristolochiaceae. Each species is illustrated by a text figure. Complete diagnoses of all the groups treated are given as well as dichotomous keys, synonyms, and geographical distributions. The work is patterned after the Illustrated Flora of the Northern United States and Canada, by Britton and Brown, and its physical appearance is very similar. The pteridophytes, with the exception of the Isoetaceae, have been elaborated by William R. Maxon, the Isoetaceae by Norma E. Pfeiffer. A. S. Hitchcock has furnished the text of the Gramineae, N. L. Britton has worked the Cyperaceae with the exception of *Carex*, K. K. Mackenzie has written *Carex*, C. R. Ball has elaborated *Salix*, and F. V. Coville has given assistance in preparing the text of the Juncaceae. The following new species are described and new combinations made: *Cheilanthes intertexta* Maxon (*C. Covillei* var. *intertexta* Maxon), *Poa Piperi* Hitchcock, *Festuca Tracyi* Hitchcock, *Cyperus Hanseni* Britton, *Mariscus californicus* Britton

(*Cladium Mariscus* var. *californicum* S. Wats.), *Carex neurophora* Mackenzie, *C. viridior* Mackenzie, *C. suborbiculata* Mackenzie, *Juncus macrandrus* Coville, *Hesperoscordum lilacinum* Heller (*Triteleia lilacina* Greene), *Triteleia bicolor* (*Brodiaea bicolor* Suksdorf), *T. Howellii* (*Brodiaea Howellii* S. Wats.), *T. modesta* (*Brodiaea modesta* Hall), *Calochortus Davidsonianus* Abrams, *Razoumofskya abietina* (*Arceuthobium abietinum* Engelm.)—*E. B. Payson.*

1236. Davidson, Anstruther, and George L. Moxley. **Flora of Southern California.** *452 p.* Times-Mirror Press: Los Angeles, 1923.—The authors present a manual of the pteridophytes and spermatophytes known to grow without cultivation in Southern California. The region treated embraces the counties of Santa Barbara, San Bernardino, Riverside, Imperial, San Diego, Orange, and Los Angeles. Dichotomous keys are given to the orders, families, genera, and species. The families and the genera are chracterized by descriptions. For the species the geographical distribution is indicated as well as frequently the time of flowering. In the case of introductions the date of the 1st record is given. In general the sequence of families is that of Engler. No new species are described.—*E. B. Payson.*

1237. Gerbault, E. **Sur la nomenclature des plantes cultivées.** [The nomenclature of cultivated plants.] Rev. Bot. Appl. et. Agric. Coloniale 2: 197–199. 1922.—The writer reviews briefly the situation in regard to the naming of horticultural varieties and forms. The rules of botanical nomenclature should, he states, be applied to them theoretically. He points out the various factors which complicate the situation, and discusses the meanings of such terms as variety, form, etc.—*Paul Russell.*

1238. Rydberg, P. A. **Flora of the Rocky Mountains and adjacent plains.** 2nd ed., *xii + 1144 p.* Published by the author: New York, 1922.—This edition differs from the 1st only in the presence of a supplement (pages 1111–1144), which gives many corrections of various kinds as well as additions to the earlier text. Some 139 species are added to the list of species that occur within the range of the work. The following new combinations, new names, and new species occur: *Aira curtifolia* (*Deschampsia curtifolia* Scribn.), *A. alpicola* (*Deschampsia alpicola* Rydb.), *A. pungens* (*Deschampsia pungens* Rydb.), *A. Vaseyana* (*Deschampsia ciliata* (Vasey) Rydb., not *Aira ciliata* Spreng.), *Celtis villosula*, *Alsinopsis biflora* (*Stellaria biflora* L.), *Norta Loeselii* (*Sisymbrium Loeselii* L.), *Cartiera cuneata*, *Thelypodiopsis juniperorum* (*Sisymbrium juniperorum* Payson), *Xylophacos lenophyllus*, *Homalobus canovirens*, *Comandra californica* Eastwood.—*E. B. Payson.*

1239. Rydberg, P. A. **Indigoferae, Galegeae** (pars). North Amer. Flora 24: 137–200. 1923.—In continuation of previous work on the Leguminosae (Fabaceae) the author here presents a systematic treatment of the genera and species of the *Indigoferae* and part of the *Galegeae*. The principal genera treated are *Indigofera* with 50, *Cracca* with 72, and *Brogniartia* with 37 species. The following new species are described and new combinations and new names are made: *Indigofera sphenoides*, *I. nana*, *I. argentata*, *I. brevipes* (*I. leptosepala* var. *brevipes* S. Wats.), *I. Hartwegii* (*I. mexicana* Benth., not L.), *I. laevis*, *I. Rosei*, *I. constricta* (*I. torulosa H.* & A., not E. Meyer), *I. Langlassei*, *I. lancifolia*, *I. discolor*, *I. panamensis*, *I. Nelsonii*, *I. pueblensis*, *Cracca calva*, *C. Conzattii*, *C. foliolosa*, *C. Mohrii*, *C. leucosericea*, *C. Roseana*, *C. Thurberi* (*Tephrosia Thurberi* Gray), *C. arcuata*, *C. Heydeana*, *C. velutina*, *C. Carpenteri*, *C. potosina* (*Tephrosia potosina* Brandeg.), *C. californica*, *C. cana* (*Tephrosia cana* Brandeg.), *C. texana*, *C. hamata* (*Tephrosia hamata* Brandeg.), *C. littoralis* (*Vicia littoralis* Jacq.), *C. Curtissii* Small, *C. piscatoria* (*Galega piscatoria* Ait.), *C. hypoleuca* (*Indigofera Perriniana* Spreng., not *Cracca Perriniana* (Spreng.) Kuntze), *C. Wallichii* (*Tephrosia Wallichii* Graham), *C. cathartica* (*Galega cathartica* Sessé & Moc.), *C. domingensis* (*Galega domingensis* Willd.), *C. Rusbyi*, *C. bracteolata* (*Tephrosia bracteolata* Guill. & Perr.), *Peteria glandulosa* (*P. scoparia* var. *glandulosa* A. Gray), *Brogniartia paniculata* Rose, *B. pauciflora* Rose, *B. alamosana*, *B. strigillosa*, *B. canescens* (*B. minutifolia* var. *canescens* S. Wats.), *B. angustata*, *B. hirsuta*, *B. argentea*, *B. Pringlei*.—*E. B. Payson.*

1240. Wear, Sylvanus. **A second supplement to, and summary of Stewart and Corry's Flora of the north-east of Ireland.** Small 8 vo, *vii + 129 p., 3 photo. illus.* The Belfast Naturalists' Field Club: Belfast, 1923.—The present edition embodies important information relative to the flora of northeastern Ireland which has accrued during the past 28 years, since the publication of the 1st supplement in 1895. The mosses and hepatics are not included in the present publication.—*J. M. Greenman.*

PTERIDOPHYTES

1241. Kümmerle, J. B. **Pteridologiai közlemények.** [Pteridological contributions.] Magyar Bot. Lapok **19**: 2–10. *3 fig.* 1920.—**Biropteris** *antri-Jovis*, n. gen. and n. sp. (Aspleniaceae) intermediate between *Phyllitis* and *Asplenium*, is described from Crete. *Asplenium obovatum* Viv. is reported from the island of Arbe, Dalmatia, and is considered a valid species, a description being given. *Cystopteris fragilis* var. *dentata* subvar. *woodsioides* Christ is reported as new to Hungary.—*J. R. Schramm.*

1242. Kümmerle, J. B. **Pteridologiai közlemények.** [Pteridological contributions.] Magyar Bot. Lapok **21**: 1–5. *1 pl.* 1922.—*Asplenium Jávorkae* Kümm. n. hybr. (*A. lepidum* × *A. Ruta muraria*) and *A. Csikii* Kümm. & Andrasovszky from Albania are described as new to science.—*J. R. Schramm.*

1243. Maxon, W. R. **Occasional notes on old world ferns.—I.** Proc. Biol. Soc. Washington **36**: 169–178. 1923.—*Tectaria Setchellii* and *T. Stearnsii* are described as new. *Ophioglossum angustatum* (*O. japonicum* Prantl, not Thunb.), *Lophidium dichotomum* (*Acrostichum dichotomum* L.), *Dryopteris transversaria* (*Nephrodium transversarium* Brack.), *D. setigera* (Blume) Kuntze, *D. ornata* (Wall.) C. Chr., *D. leucolepsis* (*Lastrea leucolepsis* Presl.), *Egenolfia sinensis* (*Acrostichum sinense* Baker), *Tectaria Gaudichaudii* (*Aspidium Gaudichaudii* Mett.), and *T. tenuifolia* (*Aspidium tenuifolium* Mett.) are discussed.—*J. C. Gilman.*

1244. Tavel, F. v. **Saisondimorphismus bei Asplenium Ruta muraria.** [Seasondimorphism in Asplenium Ruta muraria.] [Abstract.] Mitteil. Naturf. Ges. Bern. 1922: 32. 1923.—*Asplenium Ruta muraria* has summer leaves like the type of var. *ellipticum* Christ, and winter leaves corresponding to the varieties *leptophyllum* Wallr. and *angustifolium*. Beside them, the var. *leptophyllum* occurs also independently from the var. *ellipticum*.—*S. Blumer.*

SPERMATOPHYTES

1245. Bihari, Gyula. **Egy új Rumex-hybrid.** [A new Rumex hybrid.] Magyar Bot. Lapok **19**: 40. 1920.—The author describes a new hybrid, *Rumex hungaricus* (*R. Hydrolapathum* × *confertus*), from the vicinity of Mezöcsáth, Hungary.—*J. M. Greenman.*

1246. Blake, S. F. **A new Gymnocoronis from Mexico.** Proc. Biol. Soc. Washington **36**: 179–180. 1923.—*Gymnocoronis sessilis* Blake is described as new and compared with the other members of this genus.—*J. C. Gilman.*

1247. Boros, Ádám. **Egy új szittyó-fajvegyülékröl.** [A new Juncus hybrid.] Magyar. Bot. Lapok **19**: 41–42. 1920.—*Juncus Degenianus* (*J. lampocarpus* × *subnodulosus*) is described as a new hybrid from central Hungary.—*J. M. Greenman.*

1248. Burkill, I. H. **Haplochorema sumatranum.** Gardens' Bull. Straits Settlements **3**: 18–19. 1923.—A description is given of this new species from Bukit Kramat Kuda, Sinolangit, Sumatra. The author suggests that the ovaries of all species of *Kaempferia*, *Gastrochilus*, and *Haplochorema* should be examined afresh to decide as to their distinction.—*R. E. Holttum.*

1249. Burkill, I. H. **Orchid notes.** Gardens' Bull. Straits Settlements **3**: 12–18. *7 fig.* 1923.—Descriptions are given of the following new species: *Dendrobium* (*Sarcopodium*) *citrino-castaneum* from Johore; *Saccolabium crucicallus* from Lower Siam, and of the new variety *Ascochilus hirsutus* (Hk.) Ridl. var. *porphyrochlamys*, of uncertain origin. Notes are given on: an unusual specimen of *Dendrobium callibotrys* Ridl.; the flowering of *Bulbophyllum pustulatum* Ridl.; the discovery of *Cymbidium lancifolium* Hook. on Tiger Hill, Penang; *Coelogyne cymbidioides* Ridl.; *Arachnis breviscapa* J. J. Smith.—*R. E. Holttum.*

1250. Degen, A. v. **Megjegyzések néhány keleti növényfajról.** [Notes on some oriental plants.] Magyar Bot. Lapok **19**: 48. 1920.—*Galium Stojanovii* n. sp. is described from Bulgaria.—*J. R. Schramm.*

1251. Gleason, Henry Allan. **The Bolivian species of Vernonia.** Amer. Jour. Bot. **10**: 297–309. 1923.—Fifty-two species of this genus are considered, including members of the sections *Stenocephalum*, *Critoniopsis*, and *Lepidaploa*. The following new species, all belonging to the last of these 3 sections, are described: *Vernonia cuncifolia*, *V. Buchtieni*, *V. mapirensis*, *V. pseudomollis*, *V. prenanthoides*, and *V. canaminiana*.—*E. W. Sinnott.*

1252. Jávorka, S. **Lunaria Telekiana Jáv. n. spec.** Magyar Bot. Lapok 19: 1–2. 1920. —The species described is from northern Albania.—*J. R. Schramm.*

1253. Jávorka, S. **Plantae in insula Creta a Ludovico Biró lectae.** Magyar Bot. Lapok 21: 25–26. 1922.—*Thlaspi microphyllum* Boiss. & H. subsp. *creticum* Deg. & Jáv. and *Satureja Birói* Jáv. are described as new. Three other phanerogams are reported from Crete.—*J. R. Schramm.*

1254. Jávorka, S. **Plantae novae albanicae.** Magyar Bot. Lapok 20: 60–61. 1921.—*Genista Csikii* Kümm. & Jáv. and *Stachys Kümmerleana* Jáv. are described as new.—*J. R. Schramm.*

1255. Jávorka, S. **Plantae novae albanicae II.** Magyar Bot. Lapok 21: 17–22. 1922.—*Rosa Jávorkae* Deg., *Thymus Lykae* Deg. & Jáv., *T. oblongifolius* Opiz subsp. *Kümmerleanus* Deg., *Knautia Csikii* Jáv. & Szabó, *Cirsium intraspinulosum* Jáv., *Crepis Baldaccii* Hal. subsp. *Albanica* Jáv., and *C. bertiscea* Jav. are described as new to science.—*J. R. Schramm.*

1256. Johnson, Arthur Monrad. **Cryptomorpha, a new section of Saxifraga.** Amer. Jour. Bot. 10: 294–296. *2 fig.* 1923.—This new section, which includes the single species *S. eriophora* Wats. is distinguished by the facts that its 2 carpels are elongate, distinct, and contracted into slender divergent styles; its ovaries semi-inferior, surrounded by a gland above the base of the hypanthium; and its stamens inserted on the upper part of the hypanthium —*E. W. Sinnott.*

1257. Johnston, I. M. **Diagnoses and notes relating to the spermatophytes chiefly of North America.** Contrib. Gray Herb. 68: 80–104. Aug. 18, 1923.—The following new species and new combinations are published: *Lilium Howellii, Alternanthera nesiotes, Pickeringia montana* Nutt. var. *tomentosa* (*Xylothermia montana* subsp. *tomentosa* Abrams), *Adenopeltis serrata* (*Excoecaria serrata* Ait.), *Astrocasia* (?) *populifolia, Cnidoscolus inermiflorus, C. Pringlei, C. aconitifolius* (*Jatropha aconitifolius* Mill.), *C. albomaculatus* (*Jatropha maculata* Pax), *C. calyculatus* (*Jatropha calyculata* Pax & Hoffm.), *C. cordifolius* (*Jatropha cordifolia* Pax), *C. herbaceus* (*Jatropha herbacea* L.), *C. loasoides* (*Jatropha loasoides* Pax), *C. longipes* (*Jatropha longipes* Pax), *C. multilobus* (*Jatropha multiloba* Pax), *C. platyandrus* (*Jatropha platyandra* Pax), *C. polyanthus* (*Jatropha polyantha* Pax & Hoffm.), *C. tenuifolius* (*Jatropha tenuifolia* Pax & Hoffm.), *C. tubulosus* (*Jatropha tubulosa* Müll.), *Ditaxis sinaloae, Jatropha arizonica, J. grandifrons, Macaranga Heynei* (*M. montana* Pax & Hoffm., not *M. montana* Merr.), *Manihot mexicana, M. rubricaulis, Pachystroma longifolium* (*Ilex longifolia* Nees), *Pera heteranthera* (*Spixia heteranthera* Schrank), *Sapium cremostachyum* (*Stillingia cremostachya* Baill.), *Stillingia texana* (*S. linearifolia* Small, not Wats.), *S. Treculiana* (*Gymnanthes Treculiana* Müll.), *Tragia leptophylla* (*T. ramosa* var. *leptophylla* Torr.), *Coldenia hispidissima* (Torr.) Gray var. *latior, Penstemon hians, Gnaphalium nubicola, G. sonorae, G. rosaceum, G. pedunculosum, G. stagnale, G. vulcanicum.* **Halliophytum** is described as a new genus of the Euphorbiaceae and to it are assigned the following species: *H. fasciculatum* (*Bernardia fasciculata* Wats.), *H. Hallii* (*Tetracoccus Hallii* Brandeg.), *H. capense* (*Securinega capensis* Johnston). The author presents a revision of the genus *Hymenopappus.* A key is given to the recognized 15 species and specimens are cited for each. The following new species and new combinations occur: *H. flavomarginatus, H. Newberryi* (*Leucampyx Newberryi* Gray), *H. pauciflorus, H. filifolius* Hook. var. *cinereus* (*H. cinereus* Rydb.). **Eremonanus,** a new genus of the Compositae, is described with 1 species, also new to science, *E. mohavensis.* This genus is said to have its nearest relative in *Dimeresia,* a monotypic genus native to Oregon.—*E. B. Payson.*

1258. Johnston, I. M. **Studies in the Boraginaceae.** Contrib. Gray Herb. 68: 43–80. Aug. 18, 1923.—I. Restoration of the genus *Hackelia.* Attention is called to the many points of dissimilarity between the annual and the biennial or perennial species of *Lappula* as that genus has been currently interpreted. *Lapulla* itself is restricted to the annual species and the name *Hackelia* Opiz is resurrected for the biennial and perennial plants. The author claims that the species of *Hackelia* are more closely related to *Eritrichium* than to *Lappula.* The following new combinations result: *Hackelia virginiana* (*Myosotis virginiana* L.), *H. pinetorum* (*Echinospermum pinetorum* Greene), *H. Roylei* (*Cynoglossum Roylei* Wall.), *H. macrophylla* (*Lappula macrophylla* Brand), *H. Dielsii* (*Lappula Dielsii* Brand), *H. revoluta* (*Cynoglossum revolutum* R. & P.), *H. costaricensis* (*Lappula costaricensis* Brand), *H. mexicana* (*Cynoglossum*

mexicanum Schl. & Cham.), *H. leptophylla* (*Lappula leptophylla* Rydb.), *H. hispida* (*Echinospermum diffusum* var. *hispidum* Gray), *H. ciliata* (*Cynoglossum ciliatum* Dougl.), *H. setosa* (*Lappula setosa* Piper), *H. cinerea* (*Lappula cinerea* Piper), *H. ursina* (*Echinospermum ursinum* Greene), *H. hirsuta* (*Lappula hirsuta* Woot. & Standl.), *H. gracilenta* (*Lappula gracilenta* Eastw.), *H. floribunda* (*Echinospermum floribundum* Lehm.), *H. Eastwoodae* (*Lappula micrantha* Eastw., not *Hackelia micrantha* (Ledel.) Opiz), *H. bella* (*Lappula bella* Macbr.), *H. nervosa* (*Echinospermum nervosum* Kell.), *H. velutina* (*Lappula velutina* Piper), *H. californica* (*Echinospermum californicum* Gray), *H. arida* (*Lappula arida* Piper), *H. arida* (Piper) Johnston var. *Cusickii* (*Lappula Cusickii* Piper), *H. diffusa* (*Echinospermum diffusum* Lehm.), *H. diffusa* (Lehm.) Johnston var. *caerulescens* (*Lappula caerulescens* Rydb.). II. The genus *Antiphytum*. The author considers *Antiphytum* to be properly placed in the *Lithospermae* rather than in the *Eritrichieae* and so should not be confused with *Plagiobotrys*, *Cryptantha* or allied genera. By application of the "logical process of residues" *Antiphytum* is found to be typified by *Anchusa cruciata* Cham. and *A. stoechadifolia* Cham. *Amblynotopsis* Macbride is considered congeneric with *Antiphytum*. A dichotomous key is provided for the recognized species of the genus and for each species a complete synonymy is also given. The following new species, new names and new combinations occur: *Antiphytum paniculatum* (*Lithospermum linifolium* Mart. & Gal., not *A. linifolium* A. DC.), *A. peninsulare* (*Krynitzkia peninsularis* Rose), *A. caespitosum*, *A. nudicalces*. III. Novelties and new combinations in the genus *Cryptantha*. The following new species and new combinations are made: *Cryptantha Abramsii*, *C. Brandegei*, *C. albida* (*Myosotis albida* HBK.), *C. falcata* (*Eritrichium falcatum* Hieron.), *C. patagonica* (*Amsinckia patagonica* Speg.), *C. Spegazzinii* (*Amsinckia angustifolia* var. *microcarpa* Speg.), *A. granulosa* (*Myosotis granulosa* R. & P.), *C. corymbosa* (*Myosotis corymbosa* R. & P.), *C. circumscissa* (*Lithospermum circumscissum* H. & A.), *C. dichotoma* (*Krynitzkia dichotoma* Greene), *C. micrantha* (*Eritrichium micranthum* Torr.), *C. micrantha* (Torr.) Johnston var. *lepida* (*Eritrichium micranthum* var. *lepidum* Gray). *Eremocarya* Greene, and *Piptocalyx* Torr. are merged into *Cryptantha*, the latter being designated as a new section in that genus. IV. A synopsis and redefinition of the genus *Plagiobotrys*. The genera *Echidiocarya* Gray, *Sonnea* Greene, and *Allocarya* Greene are merged under the older generic name *Plagiobotrys* and "the result is a genus which appears to be a very natural one, and one which admits of great precision in definition." The sculpturing and marking of the nutlets of the species formerly treated as Allocaryas are held to be "excessively variable" rather than "remarkably constant" and as a consequence many previously proposed species are reduced in the present paper. A key is given to the 49 recognized North and South American species of *Plagiobotrys* in this larger sense. Synonyms are listed under each species together with a complete bibliography. The range of each species is also indicated. The following new combinations, new species and new varieties occur: *Plagiobotrys hispidus* Gray var. *foliaceus* (*Sonnea foliacea* Greene), *P. hispidus* Gray var. *genuinus*, *P. fulvus* (*Myosotis fulva* H. & A.,) *P. fulvus* (H. & A.) Johnston var. *campestris* (*P. campestris* Greene), *P. Torreyi* Gray var. *diffusus*, *P. Torreyi* Gray var. *perplexans*, *P. tenellus* (Nutt.) Gray var. *parvulus* (*P. parvulus* Greene), *P. tenellus* (Nutt.) Gray var. *colorans* (*P. colorans* Greene), *P. californicus* (Gray) Greene vars. *genuinus*, *gracilis*, *fulvescens* and *ursinus* (*Echidiocarya ursina* Gray), *P. Kunthii* (*Anchusa Kunthii* Walp.), *P. pygmaeus* (*Anchusa pygmaea* HBK.), *P. linifolius* (*Anchusa linifolia* Lehm.), *P. mollis* (*Eritrichium molle* Gray), *P. mollis* (Gray) Johnston var. *vestita* (*Allocarya vestita* Greene), *P. mexicanus* (*Allocarya mexicana* Macbr.), *P. pedicellaris* (*Eritrichium pedicellare* Phil.), *P. humilis* (*Myosotis humilis* R. & P.), *P. congestus* (*Eritrichium humile* A. DC. var. *congestum* Wedd.), *P. Scouleri* (*Myosotis Scouleri* H. & A.), *P. australasicus* (*Eritrichium australasicum* A. DC.), *P. Piperi* (*Allocarya microcarpa* Piper, not *Plagiobotrys microcarpus* Greene), *P. Greenei* (*Echinospermum Greenei* Gray), *P. patagonicus*, *P. lithocaryus* (*Krynitzkia lithocarya* Greene), *P. Chorisianus* (*Myosotis Chorisiana* Cham.), *P. glaber* (*Lithospermum glabrum* Gray), *P. humistratus* (*Allocarya humistrate* Greene), *P. stipitatus* (*Allocarya stipitata* Greene), *P. divergens* (*Allocarya divergens* Piper), *P. Nelsonii* (*Allocarya Nelsonii* Greene), *P. plebejus* (*Lithospermum plebejum* Cham.), *P. trachycarpus* (*Krynitzkia trachycarpa* Gray), *P. Parishii* (*Eritrichium Cooperi* Gray, not *P. Cooperi* Gray), *P. salsus* (*Allocarya salsa* Brandeg.), *P. strictus* (*Allocarya stricta* Greene), *P. tenuifolius* (*Krynitzkia tenuifolia* Gray), *P.*

nitens (*Allocarya nitens* Greene), *P. orthocarpus* (*Allocarya orthocarpa* Greene), *P. mesembryanthemoides* (*Eritrichium mesembryanthemoides* Speg.), *P. muricatus* (*Lithospermum muricatum* R. & P.), *P. scopulorum* (*Allocarya scopulorum* Greene), *P. Lechleri* (*Eritrichium albiflorum* Griseb., not *Myosotis albiflora* B. & S.)—*E. B. Payson.*

1259. Kuhlmann, J. Geraldo. **Gramineas [of Matto Grosso, Brazil].** Comm. Linhas Telegraph. Estrat. Matto Grosso ao Amazonas, Pub. 67, Annexo 5. Bot. **11**: 1–95. *Pl. 1–6.* [Rio de Janeiro] 1922.—The grasses were collected by F. C. Hoehne principally in Matto Grosso while accompanying the commission engaged in laying out telegraph lines. The collections of a few others are included. A key, in Portuguese, is given to tropical American genera, the genera represented in Brazil being distinguished by bold-faced type. Forty genera and 90 species and subspecies are included of which 1 genus and 2 species are described as new. There are besides 11 varieties, several of them names only, and a number of new combinations. The species (except the new ones) are described in Portuguese, the new genus and species being in Latin. The following are new (Kuhlmann being the author unless otherwise noted): **Spheneria**, 1 species, *S. setifolia*, based on *Paspalum setifolium* Doell; *Eriochrysis Warmingiana* (*Saccharum Warmingianum* Hack.); *Arthropogon scaber* Pilger & Kuhlm.; *Sorghastrum nutans* var. *macranthum; Valota vestita* (*Panicum vestitum* Kunth); *Mesosetum eriochrysoides* (*Panicum eriochrysoides* Nees), *M. ansatum* (*Panicum ansatum* Trin.); *Axonopus scoparius* var. *glabriusculus*, *A. brasiliensis* (*Eriochloa brasiliensis* Spreng.), *A. radiatus* (*Paspalum radiatum* Trin.), *A. chrysodactylon* (*Paspalum chrysodactylon* Doell); *Paspalum Gardnerianum* var. *vestitum*, *P. Usteri* var. *villosum; Ichnanthus Rondonii; Chaetochloa cruz ardeae* (*Panicum cruz ardeae* Willd.), *C. semirugosa* (*Panicum semirugosum* Nees); *Axonopus fissifolius* (*Paspalum fissifolium* Raddi), *A. extenuatus* (*Paspalum extenuatum* Nees), *A. longispicus* (*Paspalum longispica* Doell), *A. siccus* (*Paspalum siccum* Nees); *Chaetochloa speciosa* [nomen] (*Panicum speciosum* A. Braun [nomen]), *C. globolifera* (*Panicum globoliferum* Steud.), *C. scabrifolia* (*Panicum scabrifolium* Nees); *Eriochloa tridentata* (*Paspalum tridentatum* Trin.); *Eriochrysis holcoides* (*Saccharum holcoides* Hack.); *Hymenachne cordata* (*Panicum cordatum* Doell); *Mesosetum pappophorum* (*Panicum pappophorum* Nees); *Sacciolepis angustissima* (*Panicum angustissimum* Hochst.).—*Agnes Chase.*

1260. Lees, F. Arnold. **The nightmare of names in the bed of roses.** Naturalist **1919**: 211–213. 1919.—This article discusses the variability of wild roses from year to year both in vegetative particulars and fruit. The case is cited of an individual plant in which, during the course of a few years the gland furnishing, vegetative characters, etc, had changed so that it would no longer fit the same label.—*W. H. Burrell.*

1261. Parodi, Lorenzo R. **Las Gramineas de la region de Concordia (Provincia de Entre Rios). [The Gramineae of the region of Concordia (Province of Entre Rios).]** Rev. Facultad Agron. y Vet. Univ. Nacion. Buenos Aires **4**: 24–102. *Fig. 1–5.* 1922.—More than 50 genera and upwards of 150 species and several varieties of grasses are represented in the present publication. The following new combinations and new name are included: *Vallota pennicilligera* Chase (*Leptocoryphium pennicilligerum* Speg.), *Digitaria aequigluma* Parodi (*Panicum aequiglume* Hackel & Aresch.), *Axonopus barbatus* Chase (*Paspalum barbatum* Nees), and *Briza fusca* Parodi (*B. subarista* Lam. var. *fusca* Parodi).—*J. M. Greenman.*

1262. Robinson, B. L. **Records preliminary to a general treatment of the Eupatorieae—III.** Contrib. Gray Herb. **68**: 3–43. Aug. 18, 1923.—As a result of intensive study during the last 18 months of a large number of collections, both recent and of long standing, from tropical America, the author presents much additional information concerning new and previously described species of the *Eupatorieae* from Mexico, Central America, the West Indies, and South America. The following new species and varieties are described: *Ageratum Houstonianum* Mill. vars. *typicum* and *angustatum*, *Symphyopappus myricifolius*, *S. pennivenius*, *Eupatorium arthrodes*, *E. ascendeus* Sch.-Bip. vars. *typicum* and *parcisetosum*, *E. austerum*, *E. Brandegeanum*, *E. calaminthaefolium* HBK. var. *irrasum*, *E. chiquitense*, *E. conspicuum* Kunth & Bouché vars. *typicum* and *pueblense*, *E. costatipes*, *E. Debeauxii*, *E. desmocephalum*, *E. enixum*, *E. euphyes*, *E. Funckii*, *E. Galeottii*, *E. glaberrimum DC.* var. *Michelianum* (*E. Michelianum* Robinson), *E. Herzogii*, *E. Hilarii*, *E. imitans*, *E. lasium*, *E. leucomyelum*, *E. Macbridei*, *E. macromeris*, *E. Mayorii*, *E. molinum*, *E. mollicomum*, *E. multifolium*, *E. ocanense*,

E. neglectum, *E. porophylloides*, *E. praefectum*, *E. pumilum* (*Bolbostylis pumila* Gardn.), *E. pumilum* (*Gardn.*) Robins. var. *vegetius E. Radula* Chod. var. *stenophyllum*, *E. sanctopaulense*, *E. urubambense* Robins. vars. *typicum* and *determinatum*, *Eupatoriastrum triangulare* (*Bulbostylis triangularis* DC.), *Mikania Broadwayi*, *M. dictyota*, *M. Featherstonei*, *M. oreimeles*, *M. virgata*, *Brickellia gentianoides*.—*E. B. Payson.*

1263. Sherff, Earl Edward. **New or otherwise noteworthy Compositae.** Bot. Gaz. 76: 78–94. *Pl. 6–9.* 1923.—In this paper the following new combinations and new species appear: the new combinations are *Isostigma glycinaefolium* (Schz. Bip. ex Baker), *Bidens Holstii* (O. Hoffm.), *B. Steppia* (Steetz), *B. gracilior* (O. Hoffm.); the new species are *Coreopsis oblonga*, *C. Mattfeldii*, *C. Neumannii*, *C. scabrifolia*, *C. togensis*, *C. bracteosa*, *C. leptoglossa*, *C. badia*, *C. cosmophylla*, *Bidens lineata*, *B. leptolepis*, *Cosmos microcephalus*. *Bidens microcarpa* appears as a new name and is based on *Coreopsis exaristata* O. Hoffm. Notes and amplification of descriptions are presented in relation to the following species: *Isostigma glycinaefolium*, *Heterospermum rhombifolium* (Schz. Bip.) Griseb., *Glossogyne tenuifolia* (LaBill.) Cass., *Thelesperma megapotamica* (Spreng.) O. Kuntze), *Bidens subalternans* DC.—*B. W. Wells.*

1264. Solacolu, Theodore. **Notes critiques sur quelques Verbascum de Roumanie. Suite.** [Critical notes on some Roumanian species of Verbascum.] Ann. Sci. Univ. Jassy 11: 413–428. 1923.—Critical elucidation is given of the affinity of *Verbascum bracteosum* Grecescu, *V. crenatifolium* Boiss., *V. thracicum* Vel., *V. pulchrum* Vel., and the hybrid *V. crenatifolium* Boiss. × *V. phlomoides* L.—*Al. Borza.*

1265. Tidestrom, I. **New or noteworthy species of plants from Utah and Nevada.** Proc. Biol. Soc. Washington 36: 181–184. 1923.—*Eriogonum rubricaule*, *E. commixtum* Greene, *E. eximium*, *E. sericoleucum* Greene, *Arabis nevadensis*, *A. pinetorum*, *Cleomella stenosperma* Coville, *Amelanchier nitens*, *Peteria nevadensis*, *Dodecatheon Watsoni*, *Frasera induta*, and *Senecio Malmstenii* Blake are described as new. *Oxalis amplifolia* (*O. divergens* Benth. var. *amplifolia* Trel.) and *O. Grayi* (*Ionoxalis Grayi* Rose) are given as new combinations while *O. neomexicana* Dayton (*Ionoxalis monticola* Small, not *Oxalis monticola* Arechavaleta) is a new name.—*J. C. Gilman.*

1266. Trolander, A. S. **Circium acaule × arvense ny för Öland.** [Cirsium acaule ×arvense new for Öland.] Bot. Notiser 1921: 130. 1921.—This hybrid is reported as new, found at Persnäs, on Öland, a Swedish island in the Baltic.—*P. A. Rydberg.*

REVISIONS AND MONOGRAPHS

1267. Hall, Harvey M., and Frederic E. Clements. **The phylogenetic method in taxonomy; the North American species of Artemisia, Chrysothamnus, and Atriplex.** Carnegie Inst. Washington Publ. 326. *355 p., 58 pl., 47 fig.* July 20, 1923.—This work emphasizes the importance of certain methods said to be too little used in taxonomy. All classification should be based upon phylogeny; emphasis now placed upon analysis might well be largely transferred to synthesis, resulting in the assembling of taxonomic units into natural groups with their relationships clearly indicated; field, garden, and laboratory experiments are urged as necessary to determination of nature of criteria; quantitative methods are applicable and the use of statistical tables and graphs is approved; more attention to geographic distribution is suggested and extensive field work is essential because of the large number of variations and individuals only there available for study. Present methods for expression of results are declared inadequate and unsatisfactory. The recommended changes include more extensive use of phylogenetic charts, certain reforms in nomenclature, and the adoption of a broad species concept, similar to that of Bentham and of Gray. The principal evolutionary branches of the specific stock are best treated as subspecies, each of which is often composed of 1 to numerous smaller divisions—biotypes, races, mutants, ecads, etc.—to be listed and described only as numbered "minor variations." The classification of ultimate units of whatever nature is recognized as coming within the field of taxonomy. Proposed methods are illustrated by the monographic treatment of the North American species of *Artemisia* (29 species, 29 subspecies, 120 minor variations), *Chrysothamnus* (12 species, 40 subspecies, 41 minor variations), and *Atriplex* (47 species, 37 subspecies, 70 minor variations). Each genus is preceded by a chapter on history, relationships, origin and development of the sections or subgenera, criteria, relative fixity of species, etc. Keys, descriptions, and distribution with citation of specimens are

given for species and subspecies and for the former also discussion of relationships, ecology, and uses. Synonyms and minor variations are given in numbered lists following each species and accompanied by discussion as to status. Phylogenetic charts illustrate relationships of all species and of subspecies when these are numerous; statistical tables are frequent and parallel variations are shown in tabular form in some cases. All of the accepted species and most of the subspecies are illustrated. New subspecies described are: *Chrysothamnus Parryi* (Gray) Greene *imulus* and *latior*. New combinations, all published as subspecies, are: *Artemisia norvegica* Fries *saxatilis* (Besser), *heterophylla* (Besser), *globularia* (Cham.), *glomerata* (Ledeb.); *A. vulgaris* L. *Tilesi* (Ledeb.), *candicans* (Rydb.), *discolor* (Dougl.), *redolens* (Gray), *Flodmani* (Rydb.), *heterophylla* (Nutt.), *litoralis* (Suks.), *ludoviciana* (Nutt.), *gnaphalodes* (Nutt.), *longifolia* (Nutt.), *serrata* (Nutt.), *Lindleyana* (Besser), *mexicana* (Willd.), *Wrighti* (Gray); *A. Dracunculus* L. *glauca* (Pallas), *dracunculina* (Wats.); *A. campestris* L. *pacifica* (Nutt.), *caudata* (Michx.), *borealis* (Pallas), *spithamaea* (Pursh), *pycnocephala* (Less.); *A. tridentata* Nutt. *Parishi* (Gray), *nova* (Nelson), *trifida* (Nutt.), *arbuscula* (Nutt.), *Rothrocki* (Gray), *Bolanderi* (Gray); *Chrysothamnus viscidiflorus* (Hook.) Nutt. *lanceolatus* (Nutt.), *pumilus* (Nutt.), *puberulus* (D. C. Eaton), *humilis* (Greene), *stenophyllus* (Gray), *elegans* (Greene), *latifolius* (D. C. Eaton), *linifolius* (Greene); *C. Greenei* (Gray) Greene *filifolius* (Rydb.); *C. pulchellus* (Gray) Greene *Baileyi* (Wooton & Standl.), *elatior* (Standl.); *C. Parryi* (Gray) Greene *Bolanderi* (Gray), *asper* (Greene), *vulcanicus* (Greene), *monocephalus* (Nels. & Kenn.), *Howardi* (Parry), *attenuatus* (Jones), *nevadensis* (Gray); *C. nauseosus* (Pallas) Britton *gnaphalodes* (Greene), *hololeucus* (Gray), *speciosus* (Nutt.), *latisquameus* (Gray), *albicaulis* (Nutt.), *salicifolius* (Rydb.), *occidentalis* (Greene), *bernardinus* (Hall), *graveolens* (Nutt.), *pinifolius* (Greene), *consimilis* (Greene), *viridulus* (Hall), *ceruminosus* (Dur. & Hilg.), *mohavensis* (Greene), *junceus* (Greene), *turbinatus* (Jones), *glareosus* (Jones), *Bigelovi* (Gray), *leiospermus* (Gray); *Atriplex patula* L. *hastata* (L.), *glabriuscula* (Edmonst.), *litoralis* (L.), *spicata* (Wats.), *obtusa* (Cham.), *zosteraefolia* (Hook.), *alaskensis* (Wats.); *A. argentea* Nutt. *expansa* (Wats.); *A. pentandra* (Jacq.) Standl. *arenaria* (Nutt.), *confinis* (Standl.), *muricata* (H. & B.); *A. elegans* (Moq.) Dietr. *fasciculata* (Wats.); *A. Barclayana* (Benth.) Dietr. *Palmeri* (Wats.), *dilatata* (Greene), *magdalenae* (Brandeg.), *lurida* (Brandeg.), *sonorae* (Standl.); *A. Nuttallii* Wats. *tridentata* (Kuntze), *Gardneri* (Moq.), *cuneata* (Nelson), *buxifolia* (Rydb.), *falcata* (Jones); *A. lentiformis* (Torr.) Wats. *Breweri* (Wats.), *Torreyi* (Wats.), *Griffithsi* (Standl.); *A. canescens* (Pursh) Nutt. *aptera* (Nelson), *Garretti* (Rydb.), *linearis* (Wats.), *macropoda* (Rose & *Standl.*) New names appear as follows: *Artemisia vulgaris typica* (*A. vulgaris* L.), *A. Dracunculus typica* (*A. Dracunculus* L.), *A. campestris typica* (*A. campestris* L.), *A. tridentata typica* (*A. tridentata* Nutt.), *Chrysothamnus viscidiflorus typicus* (*Crinitaria viscidiflora* Hook.); *C. Greenei typicus* (*Bigelovia Greenei* Gray), *C. pulchellus typicus* (*Linosyris pulchellus* Gray), *C. Parryi typicus* (*L. Parryi* Gray), *C. nauseosus typicus* (*Chrysocoma nauseosa* Pall.), *Atriplex patula typica* (*A. patula* L.), *A. argentea typica* (*A. argentea* Nutt.), *A. pentandra typica* (*Axyris pentandra* Jacq.), *A. elegans typica* (*Obione elegans* Moq.), *A. Barclayana typica* (*O. Barclayana* Benth.), *A. Nuttalli typica* (*A. Nuttalli* Wats.), *A. lentiformis typica* (*Obione lentiformis* Torr.), *A. canescens typica* (*Calligonum canescens* Pursh.)—*H. M. Hall.*

1268. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. 6. Part 10.. *P. 571–610, pl. 244–247.* Alfred James Kent: Sydney, June, 1923.—This part presents an extended discussion of the fruit of *Eucalyptus*, and includes illustrations of different types of venation of the leaves supplementing the text contained in a previous part of this work.—*J. M. Greenman.*

1269. Payson, Edwin B. **A monographic study of Thelypodium and its immediate allies.** Ann. Missouri Bot. Gard. 9: 233–324. February 16, 1923.—In this monograph are considered the phylogeny, general morphology, and taxonomy of *Theiypodium* and its closely allied genera i.e., *Warea, Stanleyella, Chlorocrambe, Caulanthus* and *Streptanthella.* In the general discussions for each genus is considered the relative importance of such morphological characters as the gynophore, pod, style and stigma, septum, seed, flower, inflorescence, leaves and trichomes in their bearing on classification. The geographic distribution of each genus is discused. Taxonomic keys and descriptions of species are included. In the genus *Thelypodium* 14 species and 5 varieties are described. Of these *Thelypodium crispum* Greene, *T. sagittatum*

(Nutt.) Endl. var. *crassicarpum*, and *T. lilacinum* Greene var. *subumbellatum* are described as new, and the following new combinations are recorded: *Thelypodium laciniatum* (Hook.) Endl. var. *streptanthoides* (*T. streptanthoides* Leiberg), *T. laciniatum* (Hook.) Endl. var. *milleflorum* (*T. milleflorum* A. Nelson), and *T. rhomboideum* Greene var. *gracilipes* (*T. integrifolium* var. *gracilipes* Robinson). In other genera *Caulanthus sulfureus*, *C. Hallii*, *C. simulans*, and *C. stenocarpus* are described as new species, while the new combinations are *Caulanthus major* (*C. crassicaulis* (Torr.) Wats. var. *major* Jones), *C. Cooperi* (*Thelypodium Cooperi* Wats.), *C. heterophyllus* (*Streptanthus heterophyllus* Nutt.), *C. californicus* (*Stanfordia californica* Wats.), *C. flavescens* (*Strepthanthus flavescens* Hook.), *C. lasiophyllus* (*Turritis* (?) *lasiophylla* Hook. & Arn.), *C. lasiophyllus* var. *inalienus* (*Thelypodium lasiphyllum* var. *inalienum* Robinson), *C. lasiophyllus* var. *rigidus* (*Thelypodium rigidum* Greene), *C. lasiophyllus* var. *utahensis* (*Thelypodium utahense* Rydb.), and *Stanleyella Wrightii* (Gray) Rydb. var. *tenellum* (*Thelypodium Wrightii* Gray var. *tenellum* Jones). Since *Caulanthus Lemmonii* was preoccupied the new name *Caulanthus anceps* is given for *Thelyposium Lemmonii* Greene in the transfer to *Caulanthus*.—*S. M. Zeller.*

1270. Pfeiffer, Norma E. **Monograph of the Isoetaceae.** Ann. Missouri Bot. Gard. 9: 79–232. *Pl. 12–19.* November 27, 1922.—This monograph of the known species of *Isoetes* includes descriptions of 62 species with 8 varieties and 4 forms while but 2 little known species are mentioned. Of these *Isoetes ovata*, *I. lithophila*, and *I. flaccida* Shuttlew. var. *alata* (Small) are described as new and the following new combinations are proposed: *Isoetes Flettii* (*I. echinospora* var. *Flettii* Eaton), *I. velata* A. Br. var. *Perralderiana* (*I. Perralderiana* Dur. & LeTourn.), *I. Howellii* Engelm. var. *minima* (*I. minima* Eaton), *I. Braunii* Dur. var. *maritima* (*I. maritima* Underw.), *I. velata* A. Br. f. *longissima* (*I. longissima* Bory & Dur.), *I. Braunii* Dur. f. *robusta* (*I. echinospora* var. *robusta* Engelm.), and *I. macrospora* Dur. f. *hieroglyphica* (*I. hieroglyphica* Eaton). Twenty-five species, 6 varieties, and 2 forms are reported from North America, 7 species from South America, 15 from Europe, 10 from Africa, 3 each from Asia, Australia and Tasmania, 2 from New Zealand, and 1 from the Azores. A short historical sketch of the genus is given, including local names and economic uses. In the systematic study of the species and in the primary divisions of the genus constant features of a morphological character are utilized. "The megaspores run fairly constant in size and markings." These are featured in photographic plates. Other morphological characters, such as (1) the velum, (2) the lobing of the corm, (3) the ligule, and (4) the presence and number of peripheral strands of supporting tissue in the leaf, are considered in relation to classification of species. In consideration of the ecology of *Isoetes*, the geographic distribution, seasonal and floristic relations, plant associates, and physiological and structural relations are discussed.—*S. M. Zeller.*

FLORISTICS AND PLANT DISTRIBUTION

1271. Anonymous. **Schedae ad "Floram Romaniae exsiccatam" a Museo Botanico Universitatis Clusiensis editam. Centuria III.** [Exsiccatae illustrating the flora of Roumania, edited by the Botanical Museum of the University of Cluj.] Bull. Inform. Grăd. Bot. Muz. Bot. Univ. Cluj 3: 14–35. 1923.—Among this 100 plants occur oriental or Dacian rarities, as *Iris halophila* Pall., *Tulipa hungarica* Borb., *Centaurea Jankae* Brandza, *Silene pontica* Brandza; a series of critical species of *Dianthus* and *Campanula;* and the following plants new to science: *Asyneuma anthericoides* (Janka) Bornm. var. *dobrogense* Borza, *Cytisus Heuffelii* Wierzb. var. *romanicus* Prod., *Asperula cynanchica* L. var. *bazargiciensis* Prod., and *Alectorolophus rumelicus* (Velen.) Borb. f. *glabrescens* Nyarady. Seven fungi and 4 mosses complete the century.—*Al. Borza.*

1272. Bennett, Arthur. **Hippophaë rhamnoides L. and its names.** Naturalist 1922: 157–158. 1922.—A discussion of the origin and meaning of its local name "Wyebibbles" is given.—*W. H. Burrell.*

1273. Bennett, A. **Potamogeton panormitanus Ber. Biv. in South Lincolnshire.** Naturalist 1921: 112. 1921.—This plant was collected by H. Beeby from Deeping Fen, July, 1883, as *P. pusillus*. The writer urges the need for an examination of all specimens labelled *pusillus* to decide to which of the 2 species they belong.—*W. H. Burrell.*

1274. Bennett, Arthur. Statice and Atriplex in Lincolnshire. Naturalist 1922: 197. 1922.—The history of the 2 species in Lincolnshire is given.—*W. H. Burrell.*

1275. Bessey, Ernst A. **Our common dandelions.** Amer. Bot. 29: 92–93. 1923.—A discussion is presented of *Taraxacum officinale* Weber and *T. erythrospermum* Andrz.—*Susan P. Nichols.*

1276. Blom, Carl. **Några anmärkningsvärda adventiv- och ruderatväxtfynd vid Malmö åren 1912–20.** [Some remarkable adventive and ruderal finds at Malmö (city in southern Sweden) in the years 1912–1920.] Bot. Notiser 1921: 43–45. 1921.—The following are recorded: *Alopecurus myosuroides, Ambrosia artemisifolia, A. trifida, Artemisia annua, Axyris amarantoides, Brassica juncea, Bromus rubens, B. villosus, Centaurea melitensis, C. solstitialis, Chenopodium hircinum, C. leptophyllum, Cynosurus echinatus, Erysimum hieraciifolium, E. parviflorum, Gastridium lendigerum, Hirschfeldia Pollichii, Iberis amara arvatica, Lactuca saligna, Lepidium neglectum* f. *microcarpum, L. virginicum* f. *micropetalum, Malva parviflora, Medicago arabica, M. hispida, Melilotus indicus, Oenothera laciniata, Panicum miliaceum, P. sanguinale, Phalaris angusta, P. minor, Potentilla norvegica* v. *hirsuta, Rumex pulcher, Setaria glauca, Silene anglica, Sinapis arvensis* v. *Schkuhriana, Sisymbrium orientale* with f. *irioides* and f. *subhastatum, Tribulus terrester, Trinia Kitaibelii, Vaccaria pyramidata, Vulpia Myurus,* and *Xanthium echinatum.*—*P. A. Rydberg.*

1277. Boros, Á. **Adatok Békés- és Bihar-megyék síkjamak flórájához.** [Contributions to the flora of the plains of the Counties of Békés and Bihar (Hungary).] Magyar Bot. Lapok 21: 32–33. 1922.

1278. Boros, [A.] **Jegyzetek a Mohácsi sziget Flórájáról.** [Notes on the flora of the island of Mohác.] Magyar Bot. Lapok 21: 71. 1922.—Two liverworts, one fern ally, and numerous phanerogams are reported from this island in the Danube.—*J. R. Schramm.*

1279. Burkill, Harold, J. **Cornus suecica L. and Myrica Gale L. on the York Moors.** Naturalist 1922: 117–118. 1922.—The writer's impressions of these plants in 1921 are given.—*W. H. Burrell.*

1280. Butcher, R. W. **A new British flowering plant. Tillaea aquatica L.** Naturalist 1921: 369–370. 1921.—At Adel near Leeds this was found to be the dominant plant on drying mud. *W. H. Burrell.*

1281. Carter, C. S. **Crepis taraxacifolia and Claytonia perfoliata in Lincolnshire.** Naturalist 1923: 285. 1923.

1282. Cheetham, Chris, A. **Gagea lutea, at 1125 feet altitude.** Naturalist 1921: 168. 1921.—The highest station previously known in England was 750 feet, but it grows at 650 m. in Norway and Finland.—*W. H. Burrell.*

1283. Cheetham, C. A. **Inula Conyza DC. in Craven.** Naturalist 1920: 75. 1920.—The author records Ploughman's Spikenard at an altitude of 750 feet near Settle.—*W. H. Burrell.*

1284. Dallman, A. A. **Claytonia perfoliata in Nottinghamshire near Blyth.** Naturalist 1923: 200. 1923.—J. W. Carr adds a note that Boughton Breck is the only other known station for the plant in the country.—*W. H. Burrell.*

1285. Dallman, A. A. **Sambucus Ebulus in Yorkshire.** Naturalist 1921: 285. 1921.—A new station near Conisborough is recorded. Also *Astragalus glycyphyllos* was seen in the same district.—*W. H. Burrell.*

1286. Dallman, A. A. **Sambucus Ebulus L. in West Yorkshire.** Naturalist 1923: 196. 1923.—This plant was found at Barnsley.—*W. H. Burrell.*

1287. Day, F. H. **Goodyera repens near Carlisle.** Naturalist 1919: 46. 1919.—This is the 3rd record for Cumberland County.—*W. H. Burrell.*

1288. Degen, Á. v. **Megjegyzések néhány keleti növényfajról.** [Notes on some Oriental plants.] Magyar Bot. Lapok 19: 15–23. 1920.—Critical notes are recorded on several species of *Thymus* and the following plants are described as new: *Thymus Neićeffii* Degen & Urum. from Macedonia, *T. zygiodies* Grb. var. *longedentatus* Degen & Urum. from Bulgaria, *T. Kosteleckyanus* Opiz var. *macedonicus* Degen & Urum. from Macedonia, *T. Marschallianus* Willd. subsp. *rumelicus* Degen from Bulgaria, and *T. Nikolovii* Degen & Urum. from the vicinity of Rodosto.—*J. M. Greenman.*

1289. Degen, Á. v. **Megjegyzések néhány keleti növényfarjról.** [Notes on some Oriental plants.] Magyar Bot. Lapok 21: 64–66. 1922.—This article includes descriptions of 2 new plants, namely, *Alectorolophus Hayekii* from northern Albania and *Carduus nutans* L. f. *Huljákii* from central Hungary.—*J. M. Greenman.*

1290. Falconer, Wm. **Gnaphalium sylvaticum L. and Salix repens L. near Huddersfield.** Naturalist 1920: 140. 1920.

1291. Fernald, M. L. **Notes on the flora of western Nova Scotia, 1921.** Contrib. Gray. Herb. 67: 157–180, 201–208. 1922.—This is a reprint of articles bearing the same title from Rhodora 24: 157–164, 165–180, 201–208. 1922.—*E. B. Payson.*

1292. Fischer, Ed. **Neueres aus der Flora von Bern.** [Additions to the flora of Bern.] Mitteil. Naturf. Ges. Bern. 1919: 1–8. 1920.—A list of vascular plants new for the environs of Bern is given. This paper is a supplement to the writer's Flora of Bern.—*S. Blumer.*

1293. Fuentes, F. **Revisiones en la flora Chilena.** [Revisions in the Chilean flora.] Bol. Mus. Nacion. Santiago 11: 221–227. 4 *pl.* 1920.—The author describes Chilean monocotyledonous families represented by a single genus, namely, Typhaceae, *Typha angustifolia* L.; Restionaceae, *Leptocarpus chilensis* Mast.; Centrolepedaceae, *Gaimardia australis* Gaud.; Burmanniaceae, *Arachnitis uniflora* Phil.—*J. A. Faris.*

1294. Gombocz, Endre. **A Crocus variegatus Hoppe tolnamegyei elöfordulásáról.** [Occurrence of Crocus variegatus Hoppe in the county of Tolna Hungary.] Magyar Bot. Lapok 19: 47–48. 1920.

1295. Györffy, [I.] **Rövid megjegyzések a Magas-Tátra flórájához.** [Notes on the flora of the High-Tatra.] Magyar Bot. Lapok 21: 69–70. 1922.—The list includes 1 fungus, 3 pteridophytes, and a number of phanerogams.—*J. R. Schramm.*

1296. Györffy, [I.] **Xanthium echinatum (italicum) in Comitatu Csanád.** Magyar Bot. Lapok 21: 70. 1922.

1297. Hasslow, O. J. **Floristiska uppgifter från Kviinge och Gryts socknar.** [Floristic data from Kviinge and Gryts parishes (Skaane, Sweden).] Bot. Notiser 1921: 15–16. 1921.—The following species and hybrids are reported, with notes: *Oryza clandestina* (Web.) A. Br., *Poa remota* Forselles, *Rubus Lindebergii* P. J. Müll., *R. ambifarius* × *caesius*, *Epilobium montanum* × *obscurum*, *Stachys officinalis* (L.) Trev., *Arctium Lappa* × *nemorosum*, and *A. nemorosum* × *tomentosum*.—*P. A. Rydberg.*

1298. Hope, L. E. **Ribes alpinum L. in Cumberland.** Naturalist 1920: 239. 1920.—In flower near Cumwhitton in May, apparently the first example recorded for the east or north of the County.—*W. H. Burrell.*

1299. Hulják, János. **A Lathyrus pisiformis L. Hazánkban.** [Occurrence of Lathyrus pisiformis in Hungary.] Magyar Bot. Lapok 21: 63–64. 1922.

1300. Hulják, János. **Az Ajuga pyramidalis L. a Liptói Havasokban.** [Occurrence of Ajuga pyramidalis in the Carpathians of Liptau [Hungary).] Magyar Bot. Lapok 21: 23–25. 1922.—All earlier reports of this species in Hungary are apparently referable to *Ajuga genevensis* L.—*J. R. Schramm.*

1301. Jávorka, Sándor. **Két új adat hazánk flórájához.** [Two new contributions to the flora of Hungary.] Magyar Bot. Lapok 21: 67–68. 1922.—*Telekia speciosa* (Schreb.) Baumg. and *Juncus maritimus* L. are reported as having been found in Hungary.—*J. M. Greenman.*

1302. Jefferies, Norman. **Blue dandelions.** Amer. Bot. 29: 108–109. 1923.

1303. Larder, J. **Size of specimens of Acer campestre.** Naturalist 1919: 372. 1919.—Two trees near Louth, 63 and 54.5 inches circumference at 4 feet and 36 to 40 feet high, are described.—*W. H. Burrell.*

1304. Lees, F. Arnold. **Cypripedium Calceolus: Earliest record.** Naturalist 1919: 341. 1919.—For Yorkshire the orchid has been known since 1640. In a later note, p. 399, an earlier record is given, 1629, from Parkinson's Paradisi in Sole.—*W. H. Burrell.*

1305. Lees, F. Arnold. **The distribution of Gentiana verna.** Naturalist 1919: 390–391. 1919.—Discussing the origin of the spring Gentian, recently reported from the Cleveland Hills, the writer considers it a recent and natural introduction. In Teesdale, where the plant has been known since 1650, he also considers it a natural colonist of comparatively recent age rather than a reliquarial.—*W. H. Burrell.*

1306. León, H. **Una excursion botanica a la loma del gato y sus alrededores.** [Botanical excursion to Gato Mountain and its environs.] Mem. Soc. Cubana Hist. Nat. "Felipe Poey" 4: 77–84. 1922.—The flora of this region is characterized by such plants as *Calyptrogyne occidentalis* (Sw.) Maza, *Dendropanax arboreum* Decne. & Planch., *Ocotea leucoxylon* Benth. & Hook. f., *Mayepea domingensis* Krug & Urban, *Ichnanthus pallens* Munro, *Oplismenus hirtellus* Roem. & Schult., *O. setarius* Roem. & Schult., *Isachne leersioides* Griseb., *Arthrostylidium multispicatum*, and *Pharus parvifolius* Nash. Notes on the occurence of *Euterpe globosa* Gaertn., *Guatteria Blainii* Urban, *Hemianthus salicifolius*, *Gomidesia Lindeniana* Berg, *Dipholis* sp., *Torralbasia cuneifolia* Krug & Urb., *Hufelandia pendula* Nees, *Miconia tetranda* D. Don, *Graffenrieda chrysandra* Triana, *Cyrilla racemiflora* L., *Pinus cubensis* Griseb., *Vernonia parvuliceps* Ekman, *Baccharis scoparioides* Griseb., *Myrica cerifera* L., *Mecranium amygdalinum* Hook. f., *Ilex montana* Griseb., *Syntherisma sanguinale* Dulac, *S. digitata* Hitchc., *Andropogon leucostachyus* HBK., and *A. bicornis* L. are made at various points on the excursion. *Andropogon Reinoldii* Fr. León is described as new to science and the description of *Panicum ineptum* Hitchock & Chase is supplemented by additional notes.—*J. A. Faris.*

1307. Lüdi, W. **Soldanella.** [Abstract.] Mitteil. Naturf. Ges. Bern 1922: 33. 1922.

1308. Maiden, J. H. **The forest flora of New South Wales.** Vol. 7, Part 1. *P. 1–22, pl. 268–271, 13 photo. illus.* Alfred James Kent: Sydney, July, 1923.—Four species are redescribed and illustrated in the present part, namely, *Angophora intermedia* DC., *Eucalyptus Deanei* Maiden, *Codonocarpus australis* A. Cunn., and *Ochrosia elliptica* Labill.—Ibid. Part 2. *P. 23–34, pl. 272–275, 5 photo. illus.* August, 1923.—This part includes descriptions and illustrations of the following species: *Angophora subvelutina* F. v. M., *Eucalyptus Macarthuri* Deane & Maiden, *Laportea gigas* Weddell, and *Eugenia brachyandra* Maiden & Betche.—Ibid. Part 3. *P. 35–48, pl. 276–279, 2 photo. illus.* 1923. The following species are described and illustrated: *Myrsine variabilis* R. Br., *Eucalyptus botryoides* Sm., *Phyllanthus Ferdinandi* Muell. Arg., and *Pittosporum bicolor* Hook.—*J. M. Greenman.*

1309. Mason, F. A. **Yorkshire naturalists at Redcar.** Naturalist, 1921: 310–312. 1921.—The report contains notes on flowering plants and fungi of the district.—*W. H. Burrell.*

1310. Mason, F. A., and W. H. Pearsall. **Yorkshire naturalists at York.** Naturalist 1921: 347–351. 1921.—This article contains ecological notes on Askham Bog, Tillmire, and Skipurth Common. There are also lists of phanerogams, bryophytes, and fungi.—*W. H. Burrell.*

1311. Mörner, Carl Th. **Slottsholmens i Vestervik Centaurea-art.** [The Centaurea species at Slottsholmen, Vestervik, Sweden.] Bot. Notiser 1921: 99. 1921.—A species of *Centaurea* from said locality has been distributed as an exchange and referred to in literature both as *C. decipiens* Thuill. and as *C. Jacea* L. × *nigra* L. Aug. Hayek at Vienna has finally determined it as *C. nigra* L.—*P. A. Rydberg.*

1312. Neuman, L. M. **Sparganium speirocephalum Neum.** Bot. Notiser 1921: 47. 1921.—The author had received in exchange specimens determined as *Sparganium natans* × *simplex*, which turned out to be his own *S. speirocephalum*. He also discusses its specific rank.—*P. A. Rydberg.*

1313. Pearsall, W. H., and F. A. Mason. **Yorkshire Naturalists at Bridlington.** Naturalist 1923: 205–212. 1923.—The report mentions the curious rarity of *Adoxa Moschatelliinia* in the East Riding. There are notes on the phanerogams, marine algae, and fungi of the district.—*W. H. Burrell.*

1314. Pearsall, W. H., and F. A. Mason. **Yorkshire Naturalists at Dent.** Naturalist 1921: 273–281. 1921.—The report gives some ecological notes on Whernside and a record of flowering plants, mosses, liverworts, lichens, and fungi seen.—*W. H. Burrell.*

1315. Pearsall, W. H., and F. A. Mason. **Yorkshire Naturalists at Filey.** Naturalist 1923: 317–320. 1922.—Flowering plants and fungi are noted.—*W. H. Burrell.*

1316. Petrescu, C. **Sur quelques plantes aquatiques de la flore de Moldavie.** [On some aquatic plants of the flora of Moldavia.] Bull. Section Sci. Acad. Roumaine 8: 18–22. 1922.—Enumeration is made of some very rare species in the flora of Moldavia, namely: *Vallisneria spiralis* L., *Najas marina* L., *Elodea canadensis* Michx., *Leucojum aestivum* L., *Amaranthus albus* L.—*Al. Borza.*

1317. Rapaics, Raymund. **Újabb adatok Debreczen növényzetének ismeretéhez.** [**New contributions to the knowledge of the flora of Debreczen.**] Magyar Bot. Lapok 21: 16–17. 1922.—In addition to a list of 2 pteridophytes and 22 phanerogams, critical notes are recorded for *Melampyrum silesiacum* Ronniger var. *debreceniensis* Soó and *Centaurea spinulosa* Roch. f. *hajdonicalis* I. Wagn.—*J. R. Schramm.*

1318. Robinson, J. Fraser. **Cephalanthera Damasonium Druce in a calcareous wood near Brough, East Riding.** Naturalist 1922: 22. 1922.

1319. Robinson, J. Fraser. **Statice Limonium—addendum.** Naturalist 1922: 155–156. 1922.—The writer's observations on the plant in the East Riding are given.—*W. H. Burrell.*

1320. Rytz, W. **Neue und bemerkenswerte Funde aus dem Berner Oberland.** [**Supplementary list of plants from the Oberland of Bern.**] Mitteil. Naturf. Ges. Bern 1920: 156–170. 1921.—A list of vascular plants is given, including a great number of forms which are new to the region.—*S. Blumer.*

1321. Săvulescu, Tr. **Consideraţiuni geografo-morfologice asupra unor specii de Campanula.** [**Geographico-morphological considerations of some species of Campanula.**] Bul. Inform. Grăd. Bot. Muz. Bot. Univ. Cluj 3: 49–54. *1 pl.* 1923.—The author discusses the distribution and the probable origin, according to geographico-morphological considerations, of *Campanula*, section *Heterophyllae* series *Lanceolatae*, namely, *C. pseudolanceolata* Pant., *C. Beckina* Hay., *C. Baumgarteni* Becker, *C. valdensis* All., *C. lanceolata* Lap., *C. Loretiana* Wit., *C. Rhodii* Loisel., and *C. Frischii* Wit. It is certain that the extreme species, *C. valdensis* and *C. pseudolanceolata*, are younger than the others, having a great variability and a tendency to create new types. From *C. pseudolanceolata* the following types tend to arise: forma *transsilvanica* Săvul., var. *semiamplexicaulis* Vlăd. & Săval., var. *Porcii* Săvulescu, the first 2 of which are from localities especially in the middle Carpathians in Roumania, the 3rd is distributed throughout the Carpathians. At the end of the study follows a diagnosis of a new variety, *Campanula patula* L. var. *Hayeki* Săvul.—*Al. Borza.*

1322. Săvulescu, T., et T. Rayss. **Note sur quelques plantes nouvelles en Roumanie.** [**Note on some new plants of Roumania.**] Bull. Section Sci. Acad. Roumaine 8: 84–87. *1 fig.* 1923.—This paper includes descriptions of the new *Rhamnus Frangula* L. var. *latifolius* Dipp. f. *oppositifolius* forma nov. Săvulescu & Rayss, found in Bessarabia, and *Astragalus asper* Wulf. var. *leucotrichus* Săvulescu & Rayss var. nov., collected at Corpaci in Bessarabia, where was found also *Carduus hamulosus* Ehrh., a new plant for Roumania.—*Al. Borza.*

1323. Scheffer, József. **Hydrocotyle vulgaris L. im Presburger Komitate.** [**Hydrocotyle vulgaris in Presburg County, Hungary.**] Magyar Bot. Lapok 20: 61–64. 1921.

1324. Sernander, Rutger. **Allium carinatum i Upland.** [**Allium carinatum in Upland.**] Bot. Notiser 1921: 37–42. 1921.—The author reports the occurrence of *Allium carinatum* L. in a lawn at Björkkulla, Upland, central Sweden. He also discusses the similar appearance of several adventive species in the region as *Betonica officinalis*, *Dactylis glomerata* (form), *Luzula nemorosa*, *L. angustifolia*, *Poa Chaixii*, *Thymus Chamaedrys* v. *capitata*, *Avena elatior*, *Bellis perennis*, and *Holcus lanatus*.—*P. A. Rydberg.*

1325. Sledge, W. Arthur. **Viola calcarea in Yorkshire.** Naturalist 1923: 222. 1923.—Ledston, a new County station, is near the known northerly limit of the species in England.—*W. H. Burrell.*

1326. Soó, Rezsö. **A Saponaria L. nemzetség hazánkban és a Saponaria officinalis L. alakköre.** [**The genus Saponaria in Hungary and the forms of S. officinalis.**] Magyar Bot. Lapok 19: 42–47. 1920.—The author distinguishes 2 varieties and 11 forms of *Saponaria officinalis*.—*J. M. Greenman.*

1327. Streun, R. **Ein reicher Fundort von Adventivpflanzen im Stadtbezirk Bern.** [**Adventive plants from the city of Bern.**] [Abstract.] Mitteil. Naturf. Ges Bern 1922: 31. 1923.—A list of adventive vascular plants, mostly Mediterranean species, is given.—*S. Blumer.*

1328. Touton, K. **Die rheinischen Hieracien. Vorstudien zur neuen Flora der Rheinlande.** [**The Rhenish Hieracia. Preliminary studies for the new flora of the Rhine countries.**] Jahrb. Nassauischen Ver. Naturk. Wiesbaden 74: 2–50. 1922.—The 1st part of this paper, including the introduction and the discussion of 21 species of the subgenus *Pilosella*, has been abstracted [see Bot. Absts. 11, Entry 4883]. In the present part the treatment of the *Pilosellae*

is continued, 29 additional species, 63 subspecies, and numerous varieties and subvarieties being recognized as members of the Rhenish flora. The following species are described as new, Touton being the authority except where otherwise indicated: *H. infestum; H. pseudoflorentinum*, with the new subspecies *pseudoflorentinum* and *subfallax; H. pseudonigriceps*, with the new subspecies *floribundiforme* and *Schlickumianum; H. pseudoparagogum* Schlickum & Touton, with the new subspecies *discrepans, herliense, pseudoparagogum* Schlickum & Touton, and *subschlickumianum; H. pseudopilosellifloroum*, with the new subspecies *eurylepioides* Schlickum & Touton, *flagellariforme*, and *subfloribundiforme; H. pseudosulphureum; H. pseudozizianum; H. semiarvicola* Schlickum & Touton; and *H. setifolium*. Also the following new subspecies: *H. brachiatum* Bertol. subsp. *ludificans, meladeniiforme, pseudocineraceum, schultesiiforme, striatobrachiatiforme, submelanadeniiforme, subpilosellinum* Schlickum & Touton, *substriatobrachiatum, villarsiiforme*, and *zizianiforme; H. calodon* Tausch subsp. *pseudofallax; H. Dürkhemiense* Zahn subsp. *mogunticum* Zahn & Touton; *H. germanicum* N. P. subspp. *pseudogermanicum* and *sonnenbergense; H. heterodoxiforme* Zahn subspp. *nassovicum* Zahn and *subnassovicum; H. nigriceps* N. P. subsp. *pseudiseraneum* Schlickum & Touton; *H. pannonicum* N. P. subspp. *albosericeum* and *trichocymum* Zahn & Touton; *H. sulphureum* Döll. subspp. *microflorentinum* Schlickum & Touton and *pseudosubcymigerum;* and *H. Zizianum* Tausch subsp. *glomeratiforme*. Two supplements are given at the close of the paper. In the 1st, C. H. Zahn contributes a series of critical notes on the species discussed; in the 2nd, the author makes certain additions to the 1st part of his work. These include the descriptions of a new species (or grex) bearing the name *H. nigrosilvanum*, with the new subspecies *megalophylloides, subcernuiforme* Schlickum & Touton, *suberythrogrammum, submegalophyllum* and *subsilvicola;* and also of the new subspecies *amauriforme* and *trichastrocephalum* under *H. Schultesii* F. Schultz.—*A. W. Evans.*

1329. Urumov, K. **Neue und seltene Pflanzen Bulgariens. I.** [New and rare plants of Bulgaria.] Magyar Bot. Lapok 19: 33–40. 1920.—About 130 species, subspecies, varieties, and forms are enumerated in this list and the following are apparently new to science: *Oxytropis Urumovii* Jáv., *Centaurea Achtarovii* Urum., *Papaver pyreniacum* (L.) Kern. sub. sp. *Degenii* Urum. & Jáv., *Viola Grisebachiana* Vis. f. *Radoslavovii* Urum. & Jáv., *Astragalus excapus* L. var. *Puskarovii* Urum. & Jáv., *Potentilla appenina* Ten. sub. sp. *Stoianovii* Urum. & Jáv., *Campanula transsilvanica* Schur. sub. sp. *Davidovii* Urum., and *Plantago gentianoides* Sm. var. *Stefanovii* Urum. & Jáv.—*J. M. Greenman.*

1330. Wagner, Joh. **Adatok hazánk flórájához.** [Contributions to the flora of Hungary.] Magyar Bot. Lapok 19: 31–32. 1920.—The following new hybrids and variety are described: *Centaurea Trautmanni* (*C. solstitialis* × *Sadleriana*), *C. sub-Sadleriana* (*C. micranthos* × *Sadleriana*), *C. pannonica* Heuff. var. *pseudobracteata, C. pseudospuria* (*C. stenolepsis* × *pannonica*), and *C. toroczkóëensis* (*C. micranthos* × *Reichenbachioides*).—*J. M. Greenman.*

1331. Wattam, W. E. L. **Lexturus filiformis L. at Skinburness, Cumberland.** Naturalist 1920: 140. 1920.

1332. Wattam, W. E. L. **Old plant records of the Huddersfield District.** Naturalist 1920: 123–124. 1920.—Allen Godward's herbarium dating from 1868 has been presented to the Technical College. The following are mentioned as not being on record as having occurred in the Huddersfield District: *Thalictrum flavum* L., *Gnaphalium sylvatieum* L. var. *rectum* Sm., *Polemonium caeruleum* L., *Mentha piperita* Huds., *Potamogeton pusillus* L., *Carex acuta* L., *Cryptogramme crispa* Br., *Nephrodium Filix-mas* Rich., *Epimedium alpinum* L., *Vicia sylvatica* L., *Carduus heterophyllus* L., *Senecio erucifolius* L., *Andromeda polifolia* L., *Erythraea Centaurium* Pers., *Orchis Morio* L., *Habenaria viridis* Br.—*W. H. Burrell.*

1333. Wilson, A. **West Yorkshire botanical notes.** Naturalist 1919: 369. 1919.—Interesting species seen in V.C. 64 during the year include *Salix herbacea, Malaxis paludosa, Listera cordata, Parmelia pubescens*, and *Gryophora cylindrica.*—*W. H. Burrell.*

1334. Wilson, A. **West Yorkshire botanical notes.** Naturalist 1922: 397–398. 1922.—Notes on rare species and the altitudes obtained in the neighborhood of Sedbergh are given.—*W. H. Burrell.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. Livingston, *Editor*

S. F. Trelease, *Assistant Editor*

1335. Benedict, R. C. **Game laws for the conservation of wild plants.** Science 58: 39–41. 1923.

1336. Burk, Dean T. **Water glass as a mounting medium.** Science 58: 13–14. 1923.

1337. Conn, H. J. **Certified methylen blue.** Science 58: 41–42. 1923.—Certification of batches of stains has been begun with this dye. A special label appears on the container of the dye, such labels being furnished by the Commission on Standardization of Biological Stains and issued only when the manufacturer has submitted a sample for analysis. The specifications for methylen blue are given in detail.—*C. J. Lyon.*

1338. Conn, H. J. **Dye solubility in relation to staining solutions.** Science 57: 638–639. 1923.—It is admitted that it is impractical to use definite quantities of saturated solution of a stain as was suggested in a previous article [see Bot. Absts. 11, Entry 4887], in the mixing of a staining solution. It now appears essential that the manufacturer use a label which states the percentage of pure dye in a given sample.—*C. J. Lyon.*

1339. Conn, H. J. **Standardized nomenclature of biological stains.** Science 57: 743–746. 1923.—A preliminary list has been prepared by the cooperation of users and makers of stains. For the common stains there is given the Schultz number, the preferred designation, and the various synonyms. In ordering such materials the user should use the number and preferred name if possible.—*C. J. Lyon.*

1340. Herre, Albert W. C. T. **The Philippines as an ideal site for a biological station.** Sci. Monthly 17: 206–215. 1923.—The Philippines have the richest aquatic life known. They are less known scientifically than any other region. A station could be maintained by a group of institutions, which would give opportunity for broadening American biologists and for developing American biology.—*L. Pace.*

1341. Illington, G. **New foods for old. Modern needs and modern enterprise vs. the natural inertia of our appetites.** Sci. Amer. 128: 174. *3 fig.* 1923.—This is a popular article on substitutes for coffee, tea, spinach, tomato, beans, and other common foods.—*Chas. H. Otis.*

1342. Ingalls, A. G. **Sprayed rubber.** Sci. Amer. 129: 156, 205, 208. *3 fig.* 1923.—The Hopkinson process of making rubber is described.—*Chas. H. Otis.*

1343. Lodian, L. **Foreign foods in American cities. Some of the curious comestibles that have immigrated to our shores.** Sci. Amer. 128: 312–313. *8 fig.* 1923.

1344. Mount, H. A. **Our smallest toilers. How modern medicine and modern industry are putting bacteria to work.** Sci. Amer. 128: 170–171. *5 fig.* 1923.—Popular.—*Chas. H. Otis.*

1345. Richard, J. **Conférence de Paris.** [Paris conference.] Bull. Commission Internat. Exploration Sci. Mer Mediterranée 8: 1–51. 1923.—Abbreviated reports are given of work done in Egypt, Spain, France, Greece, Italy, Monaco, Tunis.—*T. C. Frye.*

1346. Stevens, O. A. **Plants which attract popular attention.** Sci. Monthly 17: 114–128. *Fig. 1–6.* 1923.—People are interested in plants for various reasons. Weeds that should be destroyed, poisonous plants, and interest in identification for information furnish some of the common motives.—*L. Pace.*